Formulation and Evaluation of Guava leaves extract face Serum.

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ABSTRACT

This work's primary goal was to create serum using several botanical extracts. Guava leaves (P. guajava L., Myrtaceae) are the main active ingredient in this mixture. Other ingredients include glycerine, aloe vera gel, coconut oil, and rose water. This plant has historically been found in South America, Africa, India, and other places. In ancient times, it was utilised as food and traditional medicine. The face serum is a cosmetic product with a high concentration. 3.

Serum has a deep formula with a high concentration of active substances, a non-oily finish, and the capacity to absorb quickly and enter the skin's deep layers. It provides the greatest pharmacological activity because of its extensive penetration. (4) Guava leaf's anti-wrinkle and whitening properties led to its adoption. Additionally, it contains antioxidant qualities that can stop premature ageing. Aloe vera gel has anti-inflammatory, antibacterial, antifungal, and wound-healing properties. It is frequently used to treat sunburn, minor wounds, bug bites, and other skin conditions. Olive oil is utilised as a skin moisturiser and has anti-inflammatory qualities. The current study assessed the antioxidant properties of the polyherbal face serum and concentrated on its formulation. Antioxidants enhance the texture and look of skin while shielding its cells from harm and ageing. Olive oil, sandalwood oil, glycerine, coconut oil, tween 20, dematerialised water, and other excipients were used in the formulation of the serum. (5)

The Food and Drug Administration (FDA) defines cosmetics as materials or preparations meant to come into contact with external Cosmetics serve the purpose of cleaning, beautifying, and enhancing the appearance of the skin while also keeping it in good shape. The facial serum's PH, physical characteristics, viscosity, spread ability, microbiological testing, cyclic temperature test, etc. were all taken into consideration. According to the stability study's findings, neither visual acuity nor homogeneity changed. (5)

KEYWORDS: Antioxidant, Cosmetic, Face serum, acne remover, moisturizer, Evaluation, Penetrate, Active substance, Polyherbal

INTRODUCTION

The word cosmetics was derived from the Greek word "komatik's" meaning having the power, arrange, skill in Decorating. (6). 'Cosmeceuticals' can be referred to as topical cosmetic pharmaceutical formulation to enhance beauty through Ingredients that provide additional health related functions or benefits on human skin. A high quantity of active substances is present in serums, which are thin, viscous topical formulations (6). A concentrated

product that is frequently used in cosmetics is serum. In the field of professional cosmetology, the name is self-explanatory. When compared to other creams, the cosmetic serum is just as concentrated. Compared to cream, serum has ten times more organic substance. Thus, address the aesthetic issue as soon as possible (5).

The skin Is the largest organ of the body and most protective organ 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 you can apply to your skin in after cleansing but before moisturizing with the intention of bringing the ingredients directly to the skin. (5)

An excellent face serum can make your skin smoother, firmer, and more hydrated while also making your pores look smaller. Antioxidants, cell-based compounds, and skin-like ingredients should be present in all skin care products, whether they are moisturising, anti-ageing, anti-wrinkle, or serums. These components are necessary for all skin types to maintain their health. Serums have local effects on the face, neck, décolleté, and eyelids, among other body areas. Regardless of age, they can be used. The aim of this study was to combine the extracts of guava leaves, aloe vera gel, glycerine, coconut oil, and rose water to create a polyhedral serum. Which was designed to result in prompt fairness.

STATEMENT OF PROBLEM & HYPOTHESIS

➢ Statement of problem:

If people are having problems like acne, pimple, fine line, redness of skin and dark spots then This guava leaves face serum can be Helpful. The make your skin more radiant, inflamated Skin and irritated skin then use guava leaves face serum.

➢ Hypothesis:

Information regarding dark spots, wrinkle removal, antiacne, and antioxidant properties is provided by the experimental study. Guava contains strong antibacterial properties. Extracts from guava leaves have strong antibacterial properties that can stop S. Aureus from growing. Metabolic processes in plant leaves P. guava leaf extracts exhibit strong antimicrobial properties. The Salmonella and Bacillus bacteria can be inhibited by these extracts. This gives it the ability to moisturise and enhance the skin's protective layer.

Type of Facial Serums (6)

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

General Description of Guava leaves

- **Family**: Mytraceae
- **Drug name**: Guava leaves
- **Biological source**: Guava leaves extract is made from the crushed leaves of Guava plant.
- **Biological name:** Psidium Guajava
- **Proximate Composition /Chemical Composition**:

Guava leaves (GLs) are a rich source of various health-promoting micro- and macronutrients as well as bioactive compounds. They contain 82.47% moisture, 3.64% ash, 0.62% fat, 18.53% protein, 12.74% carbohydrates, 103 mg ascorbic acid, and 1717 mg galli.

- **Species**: Psidium Guajava
- **Kingdom**: Planeta

The various secondary metabolites present in GLs include phenolic acids, flavonoids, triterpenoids, sesquiterpenes, glycosides, Alkaloids, and saponins. The presence of two new benzophenone galloyl Glycosides (guaianolides A and B) and one quercetin galloyl glycoside (guaianolide C) was also reported.

- **Minerals and Vitamins**:

Minerals like calcium, potassium, sulphur, sodium, iron, boron, magnesium, manganese, and vitamins C and B are abundant in guava leaves. GLs are an excellent option for human nutrition due to their greater concentrations of Mg, Na, S, Mn, and B. They can also be used as animal feed to combat micronutrient deficiencies. While vitamin B is crucial for enhancing blood circulation, nerve relaxing, and cognitive function stimulation, the increased vitamin C concentration in GLs may support immune system enhancement and blood vessel health.

- **Protein**:

On a dry weight basis, 9.73% of guava leaves have protein. Large macromolecules made up of amino acids, proteins serve as the building blocks of cells. Proteins are essential for cell signalling, development and maintenance, enzyme control, and biocatalysis.

- **Essential oil:**

GLsare a rich source of essential oils. The major constituent of GL essential oil includes 1,8-cineole and trans-caryophyllene. GL Essential oil from the Philippines was found to contain a different profile, with limonene, α-pinene, β-caryophyllene, and long Cyclone as major compounds. Ecuadorian GL essential oil contained a higher content of monoterpenes.

Fig.No.1 Dried Guava leaves Powder

Different benefits of using guava leaves on skin:

- ✓ Helps To Treat Wrinkles on Face.
- ✓ Helps To Lighten Dark Spots.
- ✓ Treats Acne and Blemishes.
- ✓ Helps To Remove Blackheads.
- ✓ Relieves Itching on Face.
- ✓ Health Benefits of Guava Leaves:
- ✓ It helps in stopping diarrhoea.
- ✓ The guava leaves content property to losing weight.

- ✓ Helps to manage the blood sugar level.
- ✓ It's had ability to fight cancer cell.
- ✓ Used for healing acne.
- ✓ Relives cough and cold.
- ✓ Reduce inflammation.
- ✓ Boosts immunity.

Selection of Herbs:

Since the relevant chemical components must be extracted from the plant materials for additional separation and characterisation, extraction is the essential first step in the investigation of medicinal plants. In the pharmaceutical industry, the phrase "extraction" refers to the process of employing certain solvents in a typical extraction procedure to separate the medicinally active parts of plant or animal tissues from the inactive or inert components. Techniques that are frequently employed to extract medicinal herbs.

MATERIAL AND METHOD

Table 1. Formula for face serum

SR. NO	INGREDIENT	WORKING FORMULA(50ML)
1.	Guava leaf extract	25ml
2.	Aloe vera	5gm
3.	Methylparaben	0.1gm
4.	Glycerine	12.5ml
5.	Sandle wood oil	1ml
6.	Coconut oil	1ml
7.	Rose water	Qt for rq

Fig.No.2 Guava leaves

Details information about Guava leaves:

• Family: Mytraceae
• Biological source: Guava leaves extract is made from the crushed leaves of Guava plant.
• Biological name: - Psidium Guajava
• Species: - Psidium Guajava
• Kingdom: - Planeta
• Geographical source: America, India
• Morphological characteristics:
1) colour: Green
2) Odor: characteristic
3) taste: sweet fruit, better leaves
4) Shape: oval in shape

Chemical constituents: Its content flavonoids, tannins, phenol, triterpenes, saponin, carotenoid, lectins, vitamins, fibre, and fatty acids, resin, glycoside.

Details information about Aloe vera:

Aloe vera is an excellent skin moisturiser. Aloe vera moisturises, revitalises, and maintains the youthful appearance of the skin layer. Because of its antimicrobial qualities, aloe vera is a great remedy for pimples and acne. Glycerine, sodium palmate, sodium carbonate, sodium palm kemelate, sorbitol, and other nutrients are all present in aloe vera powder. Aloe vera is an amazing lotion for the skin. Aloe vera hydrates, revitalises, and maintains the youthful appearance of skin. Due to it.

• **Kingdom**: Plantae
• **Order**: Asparagine's
• **Family**: Asphodelaceae
• **Subfamily**: Aphidoidea
• **Genus:** Aloe
• **Species**: A. vera
• **Binomial name**: Aloe vera (L.) Burm. f.
• **Synonyms:** Aloe barbadense Mill.

Fig No 3: Aloe vera

• **Geographical source**: Indian, America, south Africa.
• **Morphological characteristics**: Colour, Odor, Taste
1) Colour: Yellowish brown
1) Odor: Characteristic, sour
2) Taste: Bitter & unpleasant
Chemical constituents: Anthracene glycoside (11 to 40%) barbaloin, aloin, C glycoside, is barbaloin, Aloes one, Alongside A& B

Sandalwood:
There are anti-aging and anti-tanning properties in sandalwood. Additionally, it has antibacterial, cooling, astringent, calming, healing, emollient, toning, and soothing qualities that benefit skin. In India, sandalwood is widely used and has anti-aging and anti-tan properties. It is used in the treatment of skin disease, it has toning effect, emollient, antibacterial properties, Cooling astringent property, soothing and healing property.

FigNo.4 Sandal wood oil

Details Information about Coconut oil:

About 90% of the lipids in coconut oil are saturated, and the remaining 9% are unsaturated. Its saturated fats are not the same as those found in animal fats, though. Lauric acid (12:0) and other medium chain fatty acids make up more than half of the lipids in coconut oil. The greatest natural source of lauric acid is coconut oil.

- **Kingdom:** plantae
- **Family:** Aceraceae
- **Subfamily**: cocoedeae
- **Genus**: cocos
- **Common name**: coconut
- **Botanical name**: cocos nucifera linn.

Fig No.5 Coconut fruit oil

COLLECTION OF PLANT MATERIALS

The P. sidium guava leaves were gathered from the Institute of Pharmacy's Badnapur campus botanical gardens. In order to proceed with the extraction and seed separation procedures, the collected materials were washed and the flesh removed.

Preparation of the Extraction (9):

1. After thoroughly drying and washing with tap water, guava leaves were put in a blender to be ground into a powder and stored in an airtight container for later use.
2. Vitamin C was extracted from powdered guava leaves using the solvent extraction method.
3. Transfer a 25-gram container of powdered guava leaves into a China plate.
4. The powdered guava leaves are added to an iodine flask containing 100 millilitres of ethyl acetate.
5. Fill the iodine flask with the guava leaf and ethyl acetate mixture.
6. Let the mixture sit for a full day.
7. Strain the mixture using type 1 Watman filter paper, then store it in an airtight container for later use.
8. With assistance, concentrate the extract.

Method of preparation of Face Serum (5):

1) Take all oily component consist of sandalwood oil, tween 20, coconut oil,

2) mixing of all component for 10 min to obtain a uniform solution.

3) At the same time the water phase was prepared by mixing aloe vera, glycerine, guava leaves extract & small amount of rose water.

4) The oil phase added to liquid phase by drop wise under mechanical vibration at 2500 rpm.

5) finally obtain oil in water base (o/w) biphasic serum.

Chemical Test:

Test for Alkaloids:

Dandruff's test: Add a few drops of Dandruff's reagent (potassium Dandruffs bismuth iodide solution) to two millilitres of each extract. When alkaloids were present, a turbid organ or orange-red precipitate was seen.

Test of Tannins:

The ferric chloride reagent test: The ferric chloride reagent test involved pouring two to three drops of a 5% ferric chloride solution onto each extract. The presence of tannins is therefore indicated by the green (greenish-black) colour formulation. Check for compounds that are phenolic. Three drops of a 1% potassium ferrocyanide and 1%

ferric chloride solution were combined and added to two millilitres of extracts. The bluish colour formulation is evident in the positive outcome. The ferric chloride reagent test involved pouring two to three drops of a 5% ferric chloride solution onto each extract. The presence of tannins is therefore indicated by the green (greenish-black) colour formulation. Check for compounds that are phenolic. Three drops of a 1% potassium ferrocyanide and 1% ferric chloride solution were combined and added to two millilitres of extracts. The bluish colour formulation is evident in the positive outcome.

Test for Flavonoids

Alkaline reagent test:1ml of 10% solution hydroxide solution was taken and added to the extract to form yellow colour, which confirms the Presence of flavonoids.

EVALUATION PARAMETER

Physical appearance / visual inspection:

The prepared serum was tested for physical appearance and homogeneity by visual inspection.

PH Meter:

Viscosity studies: - Using a Brookfield viscometer, the rheological properties of the serum formulation were evaluated at 25° C. The measurements were taken in descending order after a full range of speed settings, starting at 10 rpm with a 30-second interval between two succeeding speeds.

Determination of Spread ability:

1gm 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.

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 few months for the prepared formulation. The samples were stored at different storage conditions of temperatures such as 3-5oC, 250C RH=60% and 40oC±2% RH=75%.

FORMULA:

$S = M \times L / T$

Where, S= Spread ability

M= Weight tide to the upper slide

L= Length of glass slide

T=Time taken to separate the slides.

RESULT & DISCUSSION

Physical Evaluation:

Sr No.	Test Parameter	Formulation 1	Formulation 2
1.	Colour	Light Brown	Light Brown
2.	Odour	Characteristic odour	Characteristic odour
3.	Consistency	Semisolid	Semisolid
4.	Homogeneity and Texture	Good	Good
5.	PH	5.4	5.4
6.	Wash ability	Washable	Washable
7.	Phase separation	Yes	Nil
8.	Irritancy	Nil	Nil

Cyclic Temperature Test:

Sr No.	Parameter	Stability
1.	Freezer Temperature	Unstable
2.	Room Temperature	Stable

CONCLUSION

The botanical-based herbal serum for acne treatment was effectively created and assessed based on a number of criteria. Guava leaves contain vitamin C, which exhibits strong antioxidant properties that aid in the treatment of dark spots and acne. It demonstrates that using it topically will have a greater impact on the skin. This face serum was created by a maceration process that included a magnetic stirrer for extraction and a homogeniser. It was then assessed using a number of evaluation parameters, including viscosity, pH, and physical assessment, which produced better and better results. After the two batches were created, it was discovered that batch F2 was the most optimal and fulfilling batch.

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