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Research Article

Formulation And Evaluation Of Herbal Face Serum

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ABSTRACT

Guava (Psidium guajava L.), a Myrtaceae family plant, is common in tropical and subtropical regions like South America, Africa, and Asia. Traditionally used for food, medicine, and dyes, guava leaves are rich in bioactive compounds, including antioxidants, which benefit skin health. These properties make guava leaves a valuable ingredient for natural cosmetics, especially face serums. Face serums deliver concentrated active ingredients, and incorporating guava leaf extracts can provide antioxidant protection, reduce inflammation, and prevent bacterial infections. This literature review explores the potential of guava leaves in cosmetics for cleansing, beautifying, and maintaining skin health. The review highlights scientific evidence supporting guava leaf extracts benefits, emphasizing their role in enhancing skin health and beauty in natural cosmetic formulations.

INTRODUCTION

Serum are thin viscosity topical products that concentrated amount contain of active ingredients. Serum is a concentrated product which 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. 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.

Serum is a skin care product that contains a gel or lightweight lotion or moisturizer 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 moisturizing, anti-aging or anti-wrinkle product or serum for skin, all of these products should contain antioxidants, cellbased ingredients and skin- like ingredients. All skin types need these ingredients to stay as healthy as possible. Gel preparations and Liquids are best for oily skin and a combination, serum and light lotion is best for normal dry skin, more

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emollients and the best moisturizing 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 in after cleansing but before moisturizing 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. This makes them a tool to identify specific skin care concerns, such as color, signs of aging. General Description of Guava leaves: -



Plants are a predominant natural source of numerous bioactive compounds. The projected growth of the plant preparation market is around USD 86.74 billion by 2022, with the largest market share belonging to the pharmaceutical sector, followed by the nutraceutical industry. Interestingly, the utilization of plant preparations for cosmetics, beverages, food, and medicine is mainly dependent on plant leaves. Among all plant organs, leaves are the largest accumulators of bioactive compounds, such as secondary metabolites. Several recent studies reported phytochemical profiles and biological activities of leaf extracts of various cultivated plants Hence, although plant leaves are considered as agricultural waste, they are a rich source of highvalue Nutra-pharmaceutical compounds.

Classification:

Kingdom – plantae

Division – Magnoliophyte

Class – Magnoliopsida

Order – Myrtales

Family – Myrtaceous

Genus –Psidium L.

Botanical Name - Psidium guajava L.

Morphological characteristics: -

1. Leaves:

- Shape: Elliptical to ovate.

- Size: 5-15 cm long and 3-6 cm wide.

- **Texture:** Leathery with prominent veins.

- Arrangement: Opposite pairs.

- Color: Dark green on the upper surface and lighter green below.

2. Stems:

- **Structure:** Young stems are quadrangular in cross-section and greenish, while older stems become cylindrical and woody.

- **Bark:** Smooth and green when young, turning to a flaky brown as it matures.

3. Flowers:

- **Type:** Bisexual and solitary or in small clusters.

- **Structure:** Five white petals and numerous stamens.

- Size: About 2-3 cm in diameter.

- Calyx: Persistent, with 4-5 lobes.

4. Fruits:

- Shape: Round, oval, or pear-shaped.

- Size: Varies, typically 4-12 cm in length.

- Skin: Thin and can be green, yellow, or pinkish.

- **Flesh:** White, pink, yellow, or red, depending on the variety.

- **Seeds:** Numerous small, hard seeds embedded in the flesh.

5. Roots:

- **System:** Shallow and spreading, with a taproot and numerous lateral roots.

Chemical composition:

Proximate 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 gallic acid equivalents (GAE)/g total phenolic compounds.

- 1. Phenolic Compounds The various secondary metabolites present in GLs acids, flavonoids. include phenolic triterpenoids, sesquiterpenes, glycosides, saponins. alkaloids, and Phenolic compounds (PCs) serve as key bioactive compounds which provide antioxidant and hypoglycemic properties to GLs. Generally, five quercetin glycosides are present in GLs. The presence of two new benzophenone galloyl glycosides (guaianolides A and B) and one quercetin galloyl glycoside (guaianolide C) was also reported.
- 2. Minerals and Vitamins- Guava leaves are the rich source of minerals, such as calcium, potassium, sulfur, sodium, iron, boron, magnesium, manganese, and vitamins C and B. The higher concentrations of Mg, Na, S, Mn, and B in GLs makes them a highly suitable choice for human nutrition and also as an animal feed to prevent micronutrient deficiency The higher vitamin C content in GLs may help in improving the immune system and maintain the health of blood vessels, whereas vitamin B plays an important role in improving blood circulation, nerve relaxation, and cognitive function stimulation.
- **3. Protein-** Guava leaves contain 9.73% protein on a dry weight basis. Proteins are large biomolecules composed of amino acids and act as building blocks of cells. Proteins play a major role in growth and maintenance, enzyme regulation, and cell signaling, and also as biocatalysts.
- **4. Essential Oil-** GL share 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 (limonene and α -pinene).

Different benefits of using guava leaves on skin:

- ✓ Helps To Treat Wrinkles on Face: Guava leaves have anti-aging properties which help to prevent the appearance of wrinkles on the face. It helps in destroying the free radicals which are damaging your skin
 - ✓ Helps To Lighten Dark Spots: Guava leaves also help to lighten the dark spots on your face and also clears as the blemishes left behind on the skin. Guava leaves make an excellent skin lightening ingredient, thereby, providing you with a clear looking complexion and a spot free skin.
 - ✓ Treats Acne and Blemishes: Guava leaves are an excellent antibacterial agent which help to treat acne, pimples, and blemishes on the face. When applied on skin, guava leaves help in reducing the appearance of pimples and acne on the face.
 - ✓ Helps To Remove Blackheads: Guava leaves can help to remove blackheads and shrink the large sized pore.
 - Relieves Itching on Face: Itching can be one of the major problems for many and if you suffer from itching on the skin inflammation, guava leaves can help to treat this problem. Due to allergy blocking compounds present in the guava leaves, it helps to instantly cure itchiness on skin.

Health Benefits of guava leaves-

- 1. Helps in stopping diarrhea.
- 2. Helps in losing weight.
- 3. Helps to manage the blood sugar level.



- 4. Helps to fight cancer.
- 5. Used for healing acne.
- 6. Relives cough and cold.
- 7. Reduce inflammation.
- 8. Boosts immunity.

Aim and Objective: -

Aim: Formulation and Evaluation of Herbal Face Serum

Objective of the study: -

- The main Objective of these study is to formulate and evaluate an herbal face serum various herb for multipurpose use.
- To improve skin texture.
- To minimize the skin pores.
- Reduce the fine lines wrinkles.

- Hydrates and nourishes the skin.
- Improve skin elasticity.
- Reduced dark circle.
- Protect from the reed radical.

Extraction of herbs: -

Extraction is the crucial first step in the analysis of medicinal plants, because it is necessary to extract the desired chemical components from the plant materials for further separation and Characterization. Extraction, as the term is used pharmaceutically, involves the separation of medicinal active portions of plant or animal tissues from the inactive or inert components by using selective solvents in standard extraction procedure. Commonly used methods in the extraction of medicinal plants:

Extraction Procedure



- v. Percolation
- vi. Soxhlet extractions
- vii. Serial exhaustive extraction

MATERIAL AND METHOD:

Collection of Plant Materials: The leaves of Psidium guajava were collected from college campus of Yashodeep Institute of pharmacy Chhatrapati Sambhaji Nagar, Maharashtra. The Collected materials were cleaned and flesh was removed for Further processes of separation of seeds and extraction.

Preparation of the Extraction-

Guava leaves were washed with tap water properly dried and placed into a blender to be

grounded into powdered form and kept in an airtight container for further use.

The solvent extraction method was used for the extraction of vitamin C from guava leaves Powder.

The Soxhlet thimble was filled with the guava leaf powder and inserted into the Soxhlet main chamber and closed.

Solvent vapor moves up to the Coolum and floods into the chamber housing the thimble of solid. Some part of non-volatile compounds dissolves in solvent.



Process repeats many times until we get desired concentrated compounds in flask.

Process has been done at boiling temperature of solvent and extraction has been done in 50 ml ethanol for 1 hr.



Fig. Extraction of guava leaves



Fig. Filtration of guava leaves Extract

 Table 1. Formula for face serum

Ingredients	Working Formula (15ml)	
Guava Leaves	5 ML	
Extract		
Vitamin E	0.8 ML	
Glycerin	1 ML	
Almond Oil	4 ML	
Carbopol 940	0.2 Gm	
Water	Q.S For 15 ML	



Identification test: -

- Test for Alkaloids Dandruffs test: Take 2 ml of each extract, few drops of Dandruff's reagent (potassium Dandruffs bismuth iodide solution) was added. A turbid organ/ orange-red precipitate was observed in presence of alkaloids.
- Test of tannins- Ferric chloride reagent test: - 2-3 drops of 5% ferric chloride solution were taken and they are poured on both extracts. Then the formulation of green (greenish-black color indicates the presence of tannins.
- Test for phenolic Compounds. An equal amount of 1% Ferric chloride solution and 1 % potassium ferrocyanide was mixed, 3 drops of this prepared mixture were added to the 2 ml of extracts. The positive result shows the formulation of a bluish color,

Test for flavonoids – Alkaline reagent test: ml of 10% solution hydroxide solution was taken and added to the extract to form yellow color, which confirms the presence of flavonoids in the sample.





Fig. Phytochemical Test

EVALUATION PARAMETER: -

- 1. Physical appearance / visual inspection: -The prepared serum was tested for physical appearance and homogeneity by visual inspection.
- 2. **pH Value:** A pH meter was calibrated using a standard buffer solution. Nearly 1 ml of the face serum was properly weighed and dissolve 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 5.4-5.6
- **3. Viscosity studies:** serum formulation was tested for their rheological parameters at 25° C using Brookfield Viscometer. The measurements were made over a whole range of speed setting from 10 rpm with the 30 s between two successive speeds and then in descending order.
- **4. Determination of Spread ability: -** 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.

5. 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%.

RESULT:

Sr. No	Test Parameter	Formulation 1	Formulation 2
1	Colour	Light Brown	Light Brown
2	Odour	Characteristics Odour	Characteristics Odour
3	Consistency	Semi-solid	Semi-solid
4	Homogeneity And Texture	Good	Good
5	pH	5.4	5.6
6	Washability	Washable	Washable
7	Phase Separation	Yes	Nil
8	Irritancy	Nil	Nil

Table. Physical Evaluation



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

Table. Cyclical temperature Test

CONCLUSION: -

The herbal serum for the management of acne with botanicals was successfully formulated and evaluated for different parameters. The presence of vitamin C in guava leaves will shows high anti - oxidant which will help in the management of acne and dark spots. It shows that it will give a better effect on the skin when used to topically. This Formulation of face serum was done by using Soxhlet extraction method, homogenizer method and further evaluated by various evaluation parameters such as physical evaluation, pH value, viscosity gives better and good result. The two batches were formulated and it was found that batch F2 was the optimized and satisfactory batch.

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