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FORMULATION AND EVALUATION OF HERBAL FACE SERUM

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ABSTRACT
Guava is one of the fruit plants that is widespread in the tropics and subtropics, including South America, Africa and Asia. Traditionally this plant is often used as food, traditional medicine, dyes and others. Based on the literature review of the guava leaf plant (P. guajava L.) has many bioactive compounds that play a role in maintaining the health of the body's skin. Therefore, this plant has the potential to be the basic ingredient for the formulation of cosmetic preparations. This review literature aims to find out the tension of guava leaves (P. guajava L.) as a basic ingredient in the manufacture of natural ingredients cosmetics. According to the Food Drug Administration (FDA), cosmetics are substances or preparations intended for contact with external Cosmetics have a function, namely to clean the skin, beautify, increase attractiveness and change the appearance or maintain it in good condition.
KEYWORDS: *Antioxidant, Cosmetic, Face serum, skincare,*

INTRODUCTION

Serum are thin viscosity topical products that contain concentrated amount 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, cell-based 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 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.

Advantages

- Natural ingredients: Herbal face serums often use natural ingredients that are gentler on the skin.
- Fewer side effects: Compared to chemical-based products, herbal serums may have fewer side effects.
- Customizable: Many herbal serums can be tailored to individual skin types and concerns.
- Holistic approach: Herbal serums often focus on overall skin health and wellness.
- Antioxidant-rich: Many herbs used in face serums are rich in antioxidants, which can help protect the skin.

Disadvantages

- Variable efficacy: The effectiveness of herbal face serums can vary depending on the ingredients and individual skin types.
- Allergic reactions: Some people may be allergic to certain herbs or ingredients used in herbal face serums.
- Regulation: The regulation of herbal products can be less strict than pharmaceuticals, which may impact quality and consistency.

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- Interactions: Herbal ingredients can interact with other skincare products or medications.
- Results may take time: Herbal face serums may take longer to show results compared to chemical-based products.

AIM AND OBJECTIVE

Aim: Formulation and evaluation of Herbal Face Serum.

Objectives

- Collection And Standardization of Herbal Drug
- Preparation Of Herbal Face Serum.
- Evolution Of Herbal Face Serum

Plant Profile



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.

Classification

Kingdom – plantae
Division –Magnoliophyte Class – Magnoliopsida Order – Myrtales Family – Myrtaceous Genus –Psidium L.
Botanical Name - Psidium guajava L.

Physicochemical Analysis of Guava leaves

Color - Green
Odor – characteristic

LITERATURE SURVEY

- **Suyash Agnihotri**

The herbal serum for the management of acne with botanicals was successfully formulated and evaluated for different parameters. The result of this formulation indicates that the presence of gallic acid in both the herbs will show anti-bacterial activity, which will help in the management of acne with the retinaldehyde.

- **Miss. Purva S Rajdev**

The aim of the study was to formulate different herbals into a serum form moisturizing and glowing activity on skin. Cosmeceuticals are skin-care products that cater both cosmetics and drug. 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 moisturizing capacity and anti-aging effects to maintain healthy- and fresh-looking skin.

- **Nopi Sulastri**

Guava leaves (P. guajava L.) have many benefits as additional ingredients for anti-acne cleanser, body scrub, lotion, deodorant, toner, and face cream.

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- **Dishnu Sajeev c.**

Guava leaf extract was effective at slowing the process of lipid oxidation in fresh pork sausage. The formation of primary and secondary oxidation products were retarded best at 5000 to 6000 ppm (fat basis), which are as effective as 200 ppm BHT treatment. However, the concentration of 4000 ppm was the most effective guava leaf extract treatment since it slowed lipid oxidation almost as much as the 5000 and 6000 ppm treatments and maintained the desired red color in fresh pork sausage

- (**Oliveira et al., 2019)**

Rosehip oil (Rosa canina): High in essential fatty acids and antioxidants; supports skin regeneration and Reduce scare.

- **Draelos Et Al. (2016)**

Demonstrated the efficacy of a green tea polyphenol serum in reducing signs of photoaging in human subject

- **Kaur et al. (2019)**

showed turmeric-based serums significantly reduced hyperpigmentation and improved skin tone over 1weak

- **(Meena et al., 2011).**

neem extract serums have shown effective results in acne management by reducing propionibact serium acne population.

- **(Surjushe et al., 2008).**

aloe vera (aloe barbadensis): widely used for its anti-inflammatory, moisturizing, and healing properties

- **(Heng, 2013).**

turmeric (curcuma longa): contains curcumin, known for its anti-inflammatory, antibacterial, and skin bright properties

- (**Fu et al., 2005**).

licorice (glycyrrhiza glabra): used to treat hyperpigmentation and inflammation.

- (**Oliveira et al., 2019)**

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- (**Surjushe et al., 2008).**

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Plan of Work

1. Collection of Herbal Drug
2. Extraction of Herbal Drug
3. Phytochemical screening
4. Formulation of serum
5. Evaluation of Herbal serum.
6. Packaging of Serum.

Material and Method

Collection of Plant Materials And other drug:

The leaves of Psidium guava were collected in college campus ,The Collected materials were cleaned and fresh wash removed for Further processes of separation dry the guava leaves 8-10days, make a powder from of guava leaves after the preparation of powder extraction process perfom.



FIG: Guava leaves

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FIG: Dried Guava Leaves Powder

VITAMIN E CAPSULE

Vitamin E has been considered an anti-inflammatory agent in the skin, as several studies have supported its prevention. Topical vitamin E can reduce UV-induced skin swelling, skin thickness, erythema, and edema. It also helps make the skin nourished, hydrated, and more radiant.

Vitamin E capsules can help with eczema by reducing inflammation and providing relief from symptoms
Anti-inflammatory: Vitamin E can help reduce redness and swelling caused by inflammation, which is a common cause of eczema.
Antioxidant: Vitamin E can protect the skin from damage caused by free radicals. Hydrating: Vitamin E can help the skin absorb and retain water.



FIG: Vitamin E Capsule

SANDALWOOD

Sandalwood has an anti-tanning and anti-aging property. It also helps skin in many ways like toning effect, emollient, antibacterial properties, cooling astringent property, soothing and healing property.

The Sandalwood is common in india and it has an anti-tanning and anti-aging property. It is used in the treatment of skin disease, it has toning effect, emollient, antibacterial properties, cooling astringent property, soothing and healing property.

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FIG: Sandalwood Oil

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

- Helps in stopping diarrhea.
- Helps in losing weight.
- Helps to manage the blood sugar level.
- Helps to fight cancer.
- Used for healing acne.
- Relives cough and cold.
- Reduce inflammation.
- Boosts immunity.

Extraction of Herbal Drug

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 medicnal 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:

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Extraction Procedure

Conventional Method

a. Infusion.
b. Maceration
c. Digestion.
d. Decoction
e. Percolation
f. Soxhlet extractions
g. Serial exhaustive extraction

Non-Coventional Method

a. Ultrasound-assisted extraction

b. Supercritical fluid extraction

c. Pressurized - liquid extraction

d. Microwave assisted extraction



Fig:Extraction Of Guava Leves

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Fig: Filltration of Guava Leaves

Chemical Composition

1. **ProximateComposition**

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.

2. **Phenolic Compounds**

The various secondary metabolites present in GLs include phenolic acids, flavonoids, triterpenoids, sesquiterpenes, glycosides, alkaloids, and saponins. 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.

3. **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.

4. **Protein**

Guava leaves contains 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.

5. **Essential Oil**

Glycerin 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)

1. **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.

2. **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.

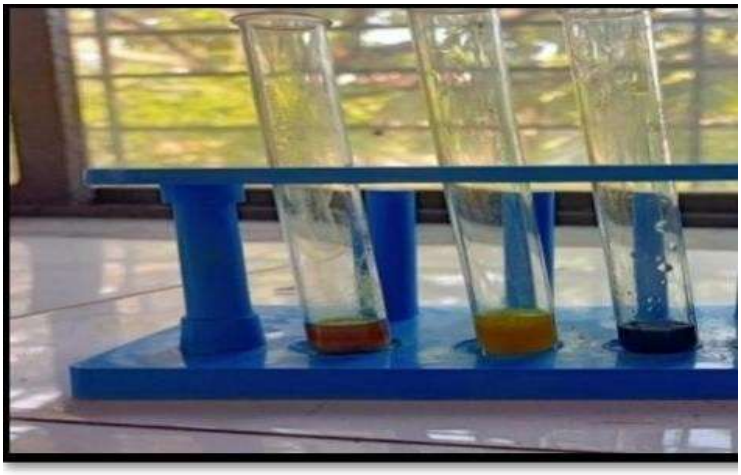
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An equal amount of 1% Ferric chloride solution and 1 % potassium ferrocyanide was mixed, 3 drops of this prepared mixture were added to the 2 ml of extracts. The positive result shows the formulation of a bluish color,

3. **Test for flavonoids**

Alkaline reagent test:

1 ml of 10% solution hydroxide solution was taken and added to the extract to form yellow colour which confirms the presence of flavonoids in the sample



Phytochemical Test

Formula Table Face Serum

Ingredients	Working Formula (15ml)
Guava Leaves Extract	5ml
Vitamin E	0.8ml
Glycerin	1ml
Sandalwood Oil	4ml
Water	Q.S 15ml

METHOD O PREAPRATION

1. Take all oily component containing glycerin.
2. Mix all components for 10 min uniform solution
3. At the same time water phase prepare guava leaves extract , almond oil, glycerin and vitamin e capsule.
4. The oil phase added to liquid phase drop by wise under mechanical vibration .
5. Finally obtain oil in water base (o/w) biphasic serum.

EVALUATION PARAMETER

Physical appearance / visual inspection

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

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

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.

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Determination of Spread Ability

2 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.

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 & DISCUSSIO

Table . Physical Evaluation

Sr.No	Test Parameter	Formulation 1	Formulation 2
1	Colour	Ligh Brown	Light Brown
2	Odour	Characterstics odour	Characteristi cs Odour
3	Consistency	Semi-soild	Semi-solid
4	Homogenicity And Texture	Good	Good
5	pH	5.4	5.6
6	Washability	Washable	Washable
7	Phase Separation	Yes	Nil
8	Irritancy	Nil	Nil

Table. Cylical Temperature Test

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

- **Test Perfomed**

1)Alkaloid	Orange Precipitate	Present Of Alkaloid
2)Flavonid	Yellow Colour	Present Of Flavonid
3)Tannins	Greenish Black Colour	Present Of tannins



Fig: Herbal Face Serum

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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 bact.

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