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FORMULATION AND EVALUATION OF GUAVA LEAVES EXTRACT FACE SERUM

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ABSTRACT

The main motive of this work was to make serum using different herbal extract. The maim active ingredient in this formulation is guava leaves (P. guajava L., Myrtaceae) and other ingredient is aloe vera gel, glycerin, and coconut oil , rose water. Traditionally this plant is often in India, south America, Africa and other countries. It is used as food and traditional medicine in ancient time. The face serum are highly concentrated cosmetic products.[3]

Serum has a quick absorption and ability to penetrate deep layers of the skin, as well as a non-oily Finish and a deep formula with a very high amount of active ingredients. Due to deep penetration it's give maximum pharmacological action.[(4)] Guava leaf was used as an outcome of the anti-wrinkle and whitening ability It also has Anti-oxidant properties that can prevent premature aging. Aloe vera gel is commonly used to treat various skin ailments, sunburn, Minor cuts, insect bites, and is also used as a wound healing, anti-inflammatory, anti-bacterial, and anti- Fungal effect. Olive oil has anti-inflammatory properties and is used as a skin moisturizing agent. The present study focused on the formulation of polyherbal face serum and evaluates the antioxidant property of serum. Antioxidants help protect skin cells from damage and aging and improve skin texture and appearance. Serum was formulated using various excipients like olive oil, sandalwood oil, glycerin, coconut oil, tween 20, dematerialized water.[(5)]

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 theappearance or maintain it in good condition of skin. The facial Serum was evaluated by its PH, physical appearance, spreadability, viscosity, microbial testing, cyclic temperature test Etc. The results of the stability study show that there was no change in visual acuity or homogeneity.[(5)]

KEY WORDS: *Antioxidant, Cosmetic, Face serum, acne remover, moisturizer, Evaluation, Penetrate, Active substance, polyherbal.*

INTRODUCTION

The word cosmetics was derived from the Greek word "kosmtikos" 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. Serum are thin viscose topical formulation that contain concentrated amount of active ingredients(6). Serum is a concentrated product which widely used in Cosmetology. The name comes from itself in professional cosmetology. The cosmetic serum is as concentrated as compared with other cream. Serum contains ten times more organic matter than cream. Therefore, deal with the cosmetic problem quickly and effectively [(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 thatyou can apply to your skin in after cleansing but before moisturizing with the intention of bringing the ingredients directly to the skin.(5) There for value of cosmetics has increased as more and more people want to stay young and attractive. Serum is a skin care product that contains a gel, light weight lotion or moisturizer and has the ability to penetrate deep to bring the active ingredients to the skin.

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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 Serums act locally upon different body parts as a face, neck, decollate, eyelids. They can be used irrespective of age . The purpose of this study was to formulate a polyhedral serum by mixing the extracts of guava leaves ,aloe vera gel, glycerin, and coconut oil , rose water. Which was intended to produce rapid fairness action.

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**

The given experimental study provides information about antioxidants property, antiacne, dark Spots, wrinkle remover. Guava has a high antimicrobial activity. Guava leaves have high Antibacterial activity in extracts that can inhibit the growth of (*S. Aureus)*. Plant leaf metabolic Extracts of P. Guava leaves have high anti-microbial activity. These extract can inhibit the Bacillus and Salmonella bacteria. This make it potential work has to improve glove of skin, as well as moisturize the skin.

LITERATURE SURVEY

Desri ayu lestari & Oktavia Rajebi

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(1).

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 sandalwood oil are mainly used. The aloe vera gel from the inner central part of the leafoften has a very good action in acne, pimples and other skin problems, burns due to heat, sun exposureand 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. [(5)]

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

AIM AND OBJECTIVE

Aim: The formulation and evaluation of guava leaves extract Face Serum.

Objective of study

- The main Objective of these study is to formulate and evaluate an herbal face serum various herb formultipurpose 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.

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General Description of Guava leaves:



Fig no 1: 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 onplant leaves. Among all plant organs, leaves are the largest accumulators of bioactive compounds, such as secondary metabolites. Several recent studies reported phytochemical profiles and biologicalactivities of leaf extracts of various cultivated plants Hence, although plant leaves are considered as agricultural waste, they are a rich source of high-value Nutra-pharmaceutical compounds.

- 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 [7]

- Guava leaves (GLs) are a rich source of various health-promoting micro- and macronutrients as wellas 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

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.

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 toprevent micronutrient deficiency The higher vitamin C content in GLs may help in improving the immunesystem and maintain the health of blood vessels, whereas vitamin B plays an important role in improving blood circulation, nerve relaxation, and cognitive function stimulation.

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 majorrole in growth and maintenance, enzyme regulation, and cell signaling, and also as biocatalysts.

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 (limonene andα-pinene)

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Fig 2:- Dried Guava leaves Powder

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 alsoclears 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 blockingcompounds present in the guava leaves, it helps to instantly cure itchiness on skin

Health Benefits of Guava Leaves

- It is helps in stopping diarrhea.
- The guava leaves content property to losing weight.
- Helps to manage the blood sugar level.
- Its have ability to fight cancer cell.
- Used for healing acne.
- Relives cough and cold.
- Reduce inflammation.
- Boosts immunity.

Selection of Herbs

Extraction is the crucial first step in the analysis of medicinal plants, because it is necessary to extractthe 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.

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MATERIAL AND METHOD

Requirement

Table 1. Formula for face serum

Sr, no.	Ingredients	WorkingFormula(50 ml)
1	Guava LeavesExtract	25 ml
2	Aloe Vera	5 gm
3	Methyl Paraben	0.1 gm
4	Glycerin	12.5 ml
5	Sandal wood oil	1 ml
6	Coconut oil	1 ml
7	Rose Water	Qt as pre req.

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: Color, Odor, Taste,

1) color: Green
2) odor: characteristic
3) taste: sweet fruit, Better leaves
4) Shape: oval in shape



Fig No 3: Guava Leaves

Chemical constituents: It content flavonoids, tannins, phenol, triterpenes, saponin, carotenoid, lectins, vitamins, fiber, and fatty acids, resin, glycoside,

Details information about Aloe vera

Aloe vera is a great moisturizer intended for a skin. Aloe vera rejuvenates skin, hydrates this and keeps skin layer looking fresh all the time. Aloe vera has anti-microbial property rendering it ideal to deal with acne and pimples. Aloe vera powder contains several nutrients like glycerin, sodium palmate, sodium carbonate, sodium palm kemelate, sorbitol, etc. Aloe vera is a phenomenal skin lotion. Aloe vera saturates, revives & keeps up with skin's energetic appearance. Because of its enemy of microbial properties, aloe vera is phenomenal for treating skin inflammation & pimples. Various supplements, including glycerin, Na-palmate, NaCO3, sodium palm kemelate, sorbitol & others, can be found in aloe vera powder.[8]



- Kingdom: Plantae
- Order: Asparagales
- Family: Asphodelaceae
- Subfamily: Asphodeloideae
- Genus: Aloe
- Species: A. vera
- Binomial name: Aloe vera (L.) Burm. f.
- Synonyms: Aloe barbadensis Mill.
- Geographical source: Indian, America, south Africa
- Morphological characteristics: Color, Odor, Taste
  1) Color: Yellowish brown
  1) Odor: Characteristic, sour
  2) Taste: Bitter & unpleasant



Fig No 4: Aloe vera

Chemical constituents: Anthracene glycoside (11 to 40%) barbaloin, aloin, C glycoside, isobarbaloin, Aloesone, Aloinoside A& B Resin

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-

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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.



Fig no 5: Sandalwood Oil

Details Information about Coconut oil

Coconut oil is made up of about 90% saturated fats and 9% unsaturated fats. However, the saturated fats in it differ from saturated fats in animal fats. Over 50% of the fats in coconut oil are medium chain fatty acids, such as lauric acid (12:0). Coconut oil is the highest natural source of lauric acid.



Fig. 1 Coconut

Kingdom	: Plantae
Family	: Arecaceae
Subfamily	: Cocoideae
Genus	: *Cocos*
Common name	: Coconut
Botanical name	: *Cocos nucifera* Linn.

Fig no 6 : Coconut Fruit Oil

Collection of Plant Materials

The leaves of P sidium guava leaves were collected from botanical gardens of college campus of Institute of pharmacy, Badnapur. The Collected materials were cleaned and flesh was removed for Further processes of separation of seeds and extraction

Preparation of the Extraction [9]

1. 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.
2. The solvent extraction method was used for the extraction of vitamin C from guava leaves powder.
3. Take a 25 gram of guava leaves of powder through the container in china dish.
4. The guava leaves powder put in to iodine flask which content 100 ml of ethyl acetate.
5. The mixture of guava leaves and ethyl acetate pour in iodine flask.
6. stare the mixture for 24 hours.
7. filtrate the mixture through watman filter paper of (type 1) and store in air tight container for further use.
8. Concentrate the extract with help of rotary evaporator.

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Fig 7 . Assembly of Extraction Method



Fig.no 8 : Extraction of Guava Leaves



Fig.no 9 : Filtration of Guava Leaves Extract

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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 obtan auniform solution .

3) At the same time the water phase was prepared by mixing aloe vera, glycerin, 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) finaly oftain oil in water base (o/w) biphasic serum.

Chemical 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 presenceof alkaloids.

Test of Tannins

Ferric chloride reagent test: - 2-3 drops of 5% ferric chloride solution were taken and they are pouredon 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 dropsof this prepared mixture were added to the 2 ml of extracts. The positive result shows the formulationof a bluish color.

Test for Flavonoids

Alkaline reagent test:
1ml 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

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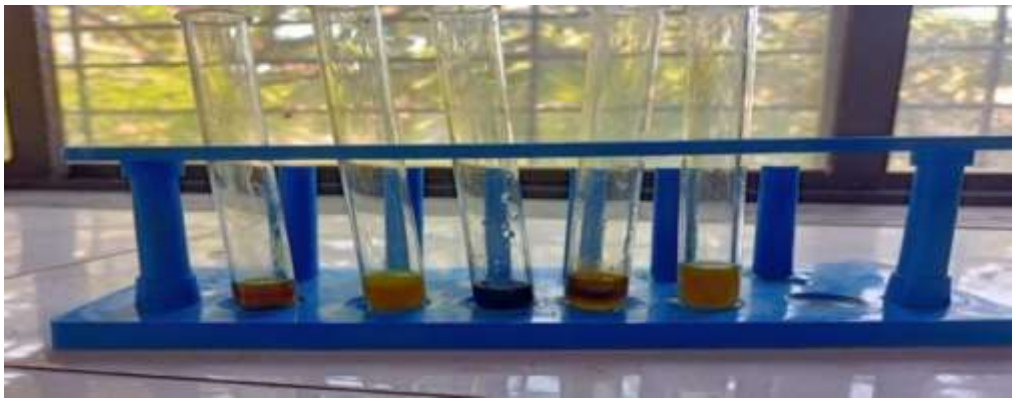


Fig no 10: Phytochemical Test

Evaluation Parameter:[4]

Physical appearance / visual inspection:

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

PH Meter



Fig No 11: PH Meter Reading

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 10rpm with the 30 s between two successive speeds and then in descending order.

Determination of Spread ability

1gm of serum sample was placed on a surface. A slide was attached to a pan to which 20 gm weightwas 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 wascarried 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= Spreadability

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M= Weight tide to the upper slide

L= Length of glass slide

T=Time taken to separate the slides.

RESULT & DISCUSSION

Table 2 . Physical Evaluation

Sr.No	Test Parameter	Formulation1	Formulation2
1	Colour	Light Brown	Light Brown
2	Odour	Characterstics odour	CharacteristicsOdour
3	Consistency	Semi-soild	Semi-solid
4	ɔmogenecity AndTexture	Good	Good
5	pH	5.4	5.04
6	Washability	Washable	Washable
7	Phase Separation	Yes	Nil
8	Irritancy	Nil	Nil

Table 3 . Cyclical temperature Test

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

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 Maceration process using magnetic stirrer of extraction method, homogenizer method and further evaluated by various evaluation parameters suchas 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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