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FORMULATION AND EVALUATION OF HERBAL FACE TONER FOR ANTI ACNEING ACTIVITY

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ABSTRACT

The present study focuses on the formulation and evaluation of a herbal face toner prepared using extracts of phyllanthus emblica, ocimum sanctum, citrus limon for their potential anti acne activity. These botanicals are rich in vitamin C, flavonoids, tannins, and essential oils that provide antioxidant, Astringent, and anti microbial effects beneficial for acne prone skin. The extracts were obtained using suitable aqueous methods and incorporated into a toner base containing rose water, glycerin, and preservatives. The prepared formulation was evaluated for clarity, color, odour, PH, viscosity, and stability under different storage conditions. Anti acne activity was assessed through anti microbial studies against acne-causing bacteria such as propionibacterium acnes and staphylococcus aureus. The results indicated that the toner possessed a skin friendly PH, good stability, and significant anti microbial potential due to the synergistic action of the herbal ingredients. overall, the study supports the use of this herbal toner as a safe and effective method for managing acne naturally.

KEYWORDS: The prepared formulation was evaluated for clarity, color, odour, PH, viscosity, and stability under different storage conditions.

INTRODUCTION

Skin

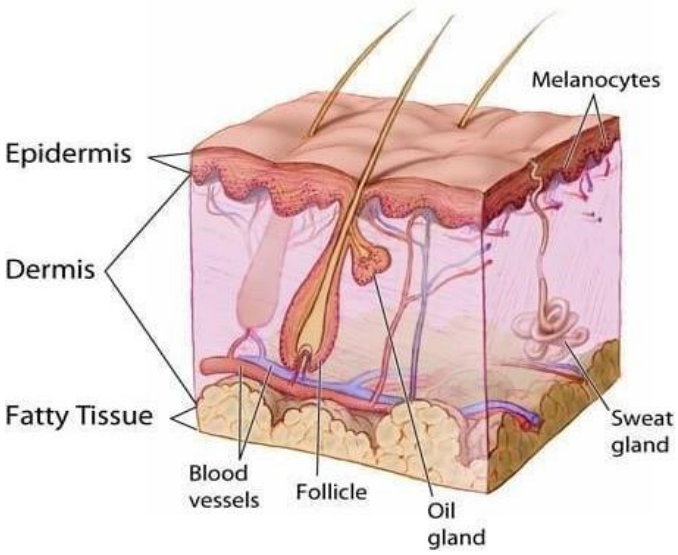
The skin is the largest organ of the human body, serving as a protective barrier against environmental hazards, pathogens, and ultraviolet radiation. It also plays a crucial role in thermoregulation, sensation, excretion, and vitamin D synthesis.

Structure of Skin

The skin consists of three major layers:

Epidermis: The outermost layer composed of keratinized stratified squamous epithelium, providing protection.

Dermis: The middle layer containing collagen, elastin, blood vessels, sweatglands, and hair follicles, providing strength andelasticity.



Hypodermis: The innermost layer composed mainly of adipose tissue, acting as insulation and energy storage.

Functions of Skin

The skin performs several vital functions including protection, regulation of body temperature, sensation, excretion of waste products, and synthesis of vitamin D.

HERBAL FACE TONER

A face toner is a water-based cosmetic preparation applied after cleansing to remove residual impurities, restore skin pH, tighten pores, hydrate the skin, and prepare it for further skincare products. Herbal toners are preferred over chemical formulations due to their minimal side

effects and additional therapeutic benefits.

ANTI-ACNE ACTIVITY

Acne is a chronic inflammatory skin disorder caused by excess sebum production, follicular blockage, bacterial colonization (Cutibacterium acnes), and inflammation. Anti-acne agents work by inhibiting acne-causing bacteria, reducing sebum secretion, preventing pore blockage, suppressing inflammation, and maintaining skin microbiome balance. Herbal ingredients such as amla, tulsi, and lemon peel possess natural antimicrobial and anti-inflammatory properties, making them suitable for acne management.

PLANT PROFILE

1. Phyllanthus emblica Linn. (Amla)

Family: Phyllanthaceae

Common Name: Indian Gooseberry

Part Used: Fruit

Geographical Distribution: Widely distributed in tropical and subtropical regions of India

Phytochemical Constituents: Vitamin C, tannins (gallic acid, ellagic acid), flavonoids, phenolic compounds, alkaloids

Pharmacological Activities: Antioxidant, antimicrobial, anti-inflammatory, anti-acne, skin rejuvenating

Relevance in Face Toner: Amla helps reduce oxidative stress, inhibits acne-causing bacteria, controls excess sebum, and improves overall skin texture due to its high antioxidant content.

2. Ocimum sanctum Linn. (Tulsi)

Family: Lamiaceae

Common Name: Holy Basil

Part Used: Leaves

Geographical Distribution: Commonly cultivated throughout India

Phytochemical Constituents: Eugenol, flavonoids, alkaloids, tannins, ursolic acid, essential oils.

Pharmacological Activities: Antimicrobial, anti-inflammatory, antioxidant, immunomodulatory.

Relevance in Face Toner: Tulsi exhibits strong antibacterial activity against acne-causing microorganisms and helps reduce inflammation, redness, and skin irritation.

3. Citrus limon (L.) Burm. f. (Lemon)

Family: Rutaceae

Common Name: Lemon

Part Used: Peel

Geographical Distribution: Cultivated widely in tropical and subtropical regions

Phytochemical Constituents: Limonene, citric acid, flavonoids, phenolic compounds,

essential oils

Pharmacological Activities: Antimicrobial, astringent, antioxidant, skin brightening

Relevance in Face Toner: Lemon peel acts as a natural astringent, tightens pores, controls oil secretion, and enhances antimicrobial activity of the formulation.

Methods of Extraction

Extraction of Phyllanthus emblica

Fresh amla fruits were washed, cut into small pieces, and weighed accurately (20–30 g). The pieces were transferred to a beaker containing 100–150 ml of distilled water and heated on a water bath at 60–70°C for 30–40 minutes. The mixture was allowed to cool and then filtered through muslin cloth to obtain a clear aqueous extract, which was stored in an airtight amber-colored container at 4°C until further use.

Extraction of Ocimum sanctum

Fresh tulsi leaves (20–30 g) were collected, washed thoroughly, and transferred to a beaker containing 100–150 ml of distilled water. The mixture was heated at 60–70°C for 30 minutes, allowed to cool, and filtered to obtain a greenish-yellow aqueous extract. The extract was stored in a clean, airtight container under refrigerated conditions.

Extraction of Citrus limon Peel

Fresh lemon peels were cleaned, shade-dried, and cut into small pieces. About 10–15 g of dried peel was boiled with 100–150 ml of distilled water for 15–30 minutes and allowed to simmer for an additional 5 minutes. The decoction was cooled and filtered to obtain the aqueous lemon peel extract, which was stored for further use.

PHYTOCHEMICAL TESTS

1. Ocimum sanctum (tulsi)

Flavonoids: Dil sodium hydroxide, hydrochloric acid

Tannins: ferric chloride sol

Vitamin C: silver nitrate sol

Alkaloids: wager’s reagent, dragendroff’s reagent

Carbohydrates: molish reagent, conc.sulphuric acid.

2. Phyllanthus emblica (Amla)

Alkaloids: wager’s reagent, dragendroff’s reagent

Tannins: ferric chloride sol

Vitamin C: silver nitrate sol

Phenolic compounds: ferric chloride sol

Carbohydrates: molish reagent, conc.sulphuric acid

3. Citrus limon (Lemon Peel)

Alkaloids : Mayer's reagent.

Carbohydrates: Molisch's reagent, conc sulphuric acid.

FORMULATION OF FACE TONER

INGREDIENTS	USES	QUANTITY TAKEN
Amla fruit extract	Antioxidant, anti-acne	3 ml
Tulsi leaves extract	Antimicrobial	3 ml
Lemon peel extract	Astringent	1.5 ml
Glycerin	Humectant	1.5 ml
Sodium benzoate	Preservative	0.6 ml
Rose water	Hydrating agent	5 ml
Lavender hydrosol	Natural fragrance	2-3 drops
Distilled water	Vehicle	q.s. to 30 ml
Citric acid	PH adjustment	q.s

Figure No. 9: Formulation of face toner.

PROCEDURE

Prepare aqueous extracts of amla, tulsi, and lemon peel using the decoction method.

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Filter and allow the extracts to cool

↓

Take required quantity of rose water\ distilled water in a beaker

↓

Add glycerin and stir well

↓

Add amla, tulsi and lemon peel extracts slowly with continuous stirring

↓

Add sodium benzoate solution into the mixture

↓

Add lavender hydrosol and mix gently

↓

Adjust pH to 4.5-5.5 using citric acid solution

↓

Make up the final volume to 30 ml, mix well, filter if required, and fill into the clean container.

EVALUATION TEST FOR FACE TONER

Appearance: liquid

Colour: light yellow

Odour: pleasant

Texture: watery liquid

Spreadability: easily spreadable

Homogeneity: homogenous face toner

Density: 1.007

PH: 4.67

Viscosity: free-flowing liquid

Clarity: no visible suspended particle

Skin irritancy test: no irritation

Stability test: stable

Surface tension: 25.02

CONCLUSION

The present project was carried out to formulate and evaluate a herbal face toner for anti-acne activity using natural plant ingredients. The herbal toner was prepared successfully and showed good physical appearance, uniformity and stability. The pH of the formulation was found to be suitable for skin application, indicating that the toner is safe and non irritating. The herbal ingredients used in the formulation possess antibacterial, anti-inflammatory and anti-oxidant properties, which help in controlling acne by reducing acne causing bacteria, excess oil and skin inflammation. The evaluation studies confirmed that the formulated toner has acceptable quality and skin friendly characteristics. From the results obtained, it can be concluded that the herbal face toner is a safe, effective and economical formulation for the management of acne. The study supports the use of herbal product as a better alternative to synthetic cosmetic preparation. Further studies and clinical evaluation can help to confirm its effectiveness on a large scale.

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