SJIF Impact Factor (2025): 8.688| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 10 | Issue: 11 | November 2025 - Peer Reviewed Journal

REVIEW ON FORMULATION AND EVALUATION OF HERBAL FACE WASH USING CITRUS LIMETTA EXTRACT

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ABSTRACT
Herbal cosmetics have gained significant interest due to their safety, efficiency and consumer preferences for natural ingredients. Among various botanical , citrus limetta (Sweet lime) has emerged as a promising ingredient because of its antioxidant, anti-inflammatory, antimicrobial and skin brightning properties. Citrus limetta is rich in vitamin c, flavonoids, phenolics and essential oils. The extract incorporates into mild surfactant base containing natural humectants and gelling agents to develop a safe, effective and gentle cleansing formulation. The prepared face wash is evaluated for physiochemical parameters such as appearance, pH, viscosity, spread ability, foamability and washability.
KEYWORDS :- *Citrus Limetta, Cosmetics, Face Wash,Antimicrobial*

INTRODUCTION

Herbal cosmetics have gained significant attention in recent years due to their safety biodegrability, minimal side effects and consumer preferences for naturally derived ingredients.

Citrus limetta commonly known as sweet lime or mosambiis, widely used in traditional medicine and cosmetics due to its rich phytochemical profile. The fruit peel and pulp contains bioactive compounds such as flavonoids ,vitamin c, limonene, citral, phenolics and essential oils .

These constituents exhibits antioxidant antimicrobial anti-inflammatory and skin brighting activities ,making citrus limetta a promising natural ingredient for skincare formulations .Its high vitamin c content helps improve skin tone promote collagen synthesis and protect the skin from oxidative damage

Formulating a herbal face wash using citrus limetta extract provides a safe ecofriendly and effective alternative to chemical based products.

OBJECTIVE

The present study focuses on formulation and evalution of herbal face wash incorporating citrus limetta extract, aiming to develop a natural cleansing formulation with enhanced skin care benefits and minimal adverse effects.

PHYTOCHEMISTRY OF CITRUS LIMETTA

Citrus limetta (sweet lime) belonging to family rutaceae is rich in various chemical constituents distributed in its peel, pulp, juice and seeds. This bioactive compounds contribute to its antioxidant , antimicrobial , anti-inflammatory and skin enhancing properties. The chemical constituents present in citrus limetta are,

1) **Flavonoids:-** Flavonoids are the major phytochemical group present in citrus limetta . They exhibit strong antioxidant and free radical scavenging activity. Different flavonoids present in citrus limetta are,
    - Hesperidine
    - Naringin
    - Naringenin
    - Quercetin
    - Rutin

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- Diosmin

2) **Vitamin C:-**It is present in high concentration in the juice and peel.Acts as a natural antioxidant, promotes collagen synthesis and improves skin glow.

3)Essential oils:- The peel contains volatile essential oils mainly,
Limonene

- Citral
- Linalool
- Terpinene
- Myrcene

4) Phenolic compounds:-Phenolic compounds produces antioxidant and anti-inflammatory properties. These are,

- Ferulic acid
- Caffeic acid
- p-coumaric acid
- Gallic acid

5) Alkaloids:- present in small amounts. These are ,

- Synephrine
- Tyramine

6) Caretenoids:- mainly found in peel and pulp.These are ,

- Beta –carotene
- Lutein

7) Organic acids:-Contribute to acidity and preservative properties. These are,

- Citric acid
- Malic acid
- Tartaric acid

8) Sugars :-Natural sugars contribute to sweetness. These are ,

- Sucrose
- Glucose
- Fructose

9) Minerals :-These are,

- Potassium
- Calcium
- Magnesium
- Phosphorus

MATERIALS AND METHODS USED

1) Plant materials and standards

Citrus limetta fresh fruit peel and pulp is used for the preparation. Analytical standards hesperidine and ascorbic acid is used for quantification.

2) Chemicals and reagents

- Ethanol and distilled water
- Methanol
- Phosphoric acid
- Glycerine as a humectant
- Preservative(phenoxyethanol+ethylhexyl glycerine)

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3) Equipement

- Analytical balance
- Magnetic stirrer with hot plate
- Freeze dryer
- PH meter
- Brookfield cone

4) METHODS USED

- **Preparation of citrus limetta extract-** Wash fresh fruits , peel and separate pulp.Air dry peel at 40-45 degree celcius or shade dry at constant weight.Grind dried peel to coarse powderat 40-60 mesh .record yield.
- **Hydroalcoholic extraction /cold maceration-**Weigh 100gm of powdered peel.Add 1000ml of 50:50 ethanol:water in an amber conical flask.Macerate with occasional shaking for 48-72 hrs at room tempreture.Filter through whatman no.1 papar.Combine filtrate and concentrate under reduced pressure using a rotaryevaporatorat less than 40 degree celcius to remove ethanol.Dry residue under vaccum or lyophilize to obtain dry extract.

5) **Formula of herbal face wash for 100gm:-**

- Citrus limetta extract 5gm
- SLES 28-30% active -15gm
- Cocamidopropyl betaine-5gm
- PEG-7 glyceryl cocoate-2gm
- Glycerine-5gm
- Carbomer-0.5gm
- Diasodium EDTA-0.05gm
- Fragrance-0.2gm
- Purified water-q.s to 100gm

MANUFACTURING STEPS

1. Sanitise all glassware and work area.Preweigh all ingredients.
2. Add 72 ml purified water into beaker sprinkle carbomer 940 slowly with stirring to avoid lumps . let hydrate for 10-15 minutes.
3. Surfactant phase- Mix sles,cocamidopropyi betaine and PEG-7 glyceryl cocoate in a separate beaker, stir gently.
4. Dissolve citrus limetta extract 5gm in water or small portion of glycerine if extract is viscous .
5. Add surfactant phase to aquous phaseslowly with overhead stirring. Mix until homogeneous.
6. Add extract solutionand glycerin to batch under stirring.
7. Add EDTA and preservative.
8. Slowly neutralize with TEA until the mixture gels and desired viscosity is achieved
9. Adjust Ph with citric acid if needed.
10. Add flavor last mix gently to avoid foam .
11. Degas if necessary, filter and fill into sterilized containers .

EVALUTION OF HERBAL FACE WASH

The quality and performance of herbal face washes must be evaluated using standard cosmetic testing parameters.

- **Physiological Evalution:-**

- Appearance and clarity
- Odour and color
- PH measurement
- Viscosity
- Spreadability
- Foam height and stability
- Dirt/sebum removal efficiency
- washability

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- **Phychemical Evalution**
  - Total phenolic content
  - Total flavonoids
  - Vitamin c estimation
  - HPTLC OR HPLC fingerprinting assay

- **Stability Studies**

Tempreture stress =4 and 25 degree celcius
Light exposure studies
Parameters evaluated in stability studies are,

- Phase separation
- Color/odour changes
- Viscosity shift
- PH variation
- Microbial growth

- **Microbial evalution:** Parameters evaluated are,
- Total aerobic microbial count
- Yeast mold count
- Pathogen screening
- Preservative efficacy test

- **Skin safety and performance Evalution :-** Parameters evaluated are,
- Patch test on volunteers
- Skin irritation study
- Sebum reduction studies
- Hydration measurement(corneometer)

CONCLUSION

Herbal face washes represent a safer and ecofriendly alternative to synthetic clansing products .Citrus limetta with its rich phytochemical profile offers multiple cosmetic benefits such as antioxidant activity, antimicrobial protection, skin brighting, and cleansing action. Proper extraction formulation and evalution techniques are crucial to ensure efficacy, safety ,and consumer satisfaction.

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