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Formulation & Evaluation Of Poly-Herbal Facewash...A Research

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1.ABSTRACT:

The objective of the present work was to formulate Poly herbal anti-acne face wash containing hydroalcoholic extract of betel leaf and to evaluate the face wash for various physical parameters, anti bacterial activity and stability. The leaves of BL powder and extracted using 90% ethanol. The concentration of SLS was optimized by adding varying quantities of SLS to 0.8% w/v Carbopol and formulating as gel. A concentration of 12% w/v of SLS and sufficient foam height and spread ability 5-7 cm. The Glycerin incorporated to provide moisturizing properties to the face wash. The formulation were faint brownish to colorless in colour with floral roses odour and were good foaming property. The PH of Formulation was between 5-6 and they exhibited good spread ability. The study present the formulation & evaluation of a poly-herbal face wash incorporating betel leaf extract as a primary active ingredient, known for its antimicrobial, antioxidant, and anti-inflammatory properties. Additional herbal extract such as Aloe vera and betel leaf, were integrating to enhance skin cleansing. The formulated face wash was evaluated for physicochemical parameters including PH, spread ability, foaming ability. The result indicates that the formulation met standard quality parameters & show antibacterial & antimicrobial activity.

Face is sensitive part of our body so care of face is one of the important task for human beings. There are several preparation are available for face care, from which face wash plays important role for improving appearance as well as for treating several facial skin conditions. Face washes prepared by herbal ingredients are better than the synthetic ingredients to avoid skin irritation and other side effects. In the present work an attempt was made to formulate & evaluate poly herbal face wash with antioxidant, antibacterial and antiseptic properties, which are necessary to keep the skin, smooth and attractive. Poly herbal Face wash is made from, aloe vera leaves, betel leaf extract, for anti Acne activity and to improve the skin and enhance beauty. Facewash improves circulation and cleanse the entire face. Prepared face wash evaluated for colour, odour, consistency, PH, spread ability, wash ability, foam ability.

KEY WORDS : Poly-herbal facewash, spreadability, anti-bacterial, betel leaf

2. INTRODUCTION :

The word cosmetic is taken for a Greek word “kosmetikos” which means to ‘adorn’ (addition of something decorative to a person or a thing) Since early days materials used for beautification or improvement of appearance comes under the category of cosmetic people want to look beautiful & the concept of cosmetic is as old as mankind & civilization. Cosmetic are product applied to the body for the purpose of beautifying cleansing improving appearance enhancing attractive features

4.1 Introduction to the skin

The skin protect against viruses regulate body temperature and improves our sense of touch and feeling. The skin is the large and important organ of the body that determines a personality, specifically sensitive skin of the face which is use as a standard measure. Protecting the body from the outside world is the skin. When expose the sunlight the skin produces vitamin D, a helpful chemical component. The skin functions as a sensory organ and helps control body temperature. Skin has a number of biological components including keratinocytes, melanocytes and erythrocytes.it has multilayered structure due to its many components including as cell and fibres the skin is made up of skin layer. The integumentary system. Consisting of skin and supporting tissues protect the entire body. Its many sympathetic and autonomic nerve fibers facilitate communication with the brain

Three primary layers:

- 1) Epidermis
- 2) Dermis
- 3) Subcutaneous tissue

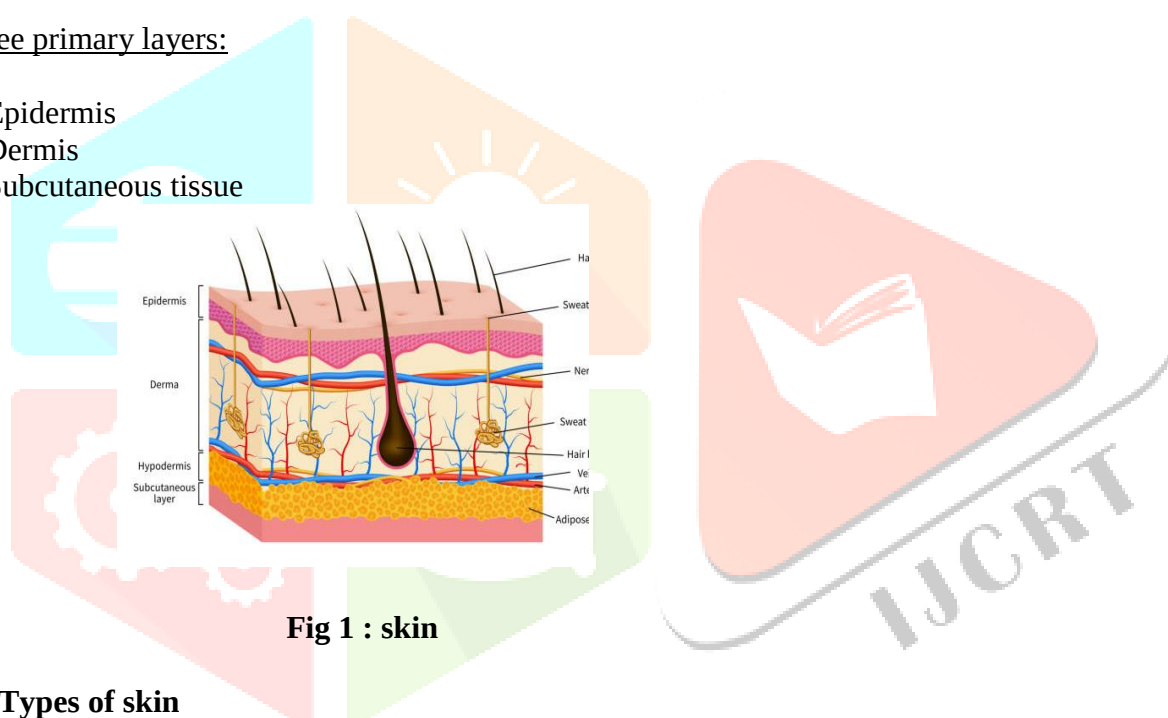


Fig 1 : skin

4.2 Types of skin

Mainly 5 types of skin

- 1) Dry skin
- 2) Oily skin
- 3) Sensitive skin
- 4) Normal skin
- 5) Combination skin

Why face wash?

It helps to maintain the pH balance of your skin while removing dirt from the pores .

4.3 Introduction of face wash

A face wash is a skin care product designed to clean the face by removing dirt ,oil ,makeup and other impurities from the skin. It typically contains a combination of surfactant, moisturizing agents and various active ingredient that help to clean, hydrate and treat the skin. Unlike regular face washes are formulated to be gentler on the delicate facial skin and often include additional beneficial ingredients to address specific skin concerns such as acne, dryness or sensitivity. Betel leaf and Alov vera are to herbs with a rich

history in traditional medicine systems, particularly Ayurveda and siddha medicine. Their combination in a polyherbal face wash leverages their respective properties for skin care.

4.4 classification of face wash

- 1) Cream based face wash
- 2) Gel based face wash
- 3) Liquid based face wash

4.5 Advantages of face wash

- 1) Keep skin fresh and healthy.
- 2) It means the skin to look radiant.
- 3) Promotes skin regeneration and rejuvenation.
- 4) Exfoliation acceleration the blood circulation.
- 5) Removing dead skin will develop wrinkles at slower pace.
- 6) Enhance skin radiation.
- 7) It supports healthy, youthful skin.

4.6 Uses of face wash

- 1) To remove all dirt to make good skin.
- 2) For cleansing the skin.
- 3) Anti-aging.
- 4) Bath and washing keep the skin clean and shiny.
- 5) Help to clear the plug pores.

4.7 Ideal Properties of face wash

- 1) It should not feel oily or greasy during application.
- 2) It should spread easily without dragging.
- 3) It should be stable and look good appearance.
- 4) A good face wash should be stable and have a pleasant appearance.
- 5) It should soften when applied to skin.
- 6) Should leave a fine emollient film on the skin after use.
- 7) It should soften when applied to the epidermis.
- 8) It should scatter without leaving a trace.
- 9) It ought to be attractive and robust.

3.LITERATURE REVIEW:

1. Gunjal et al. (2024): A polyherbal face wash containing Turmeric, Neem, Black Pepper, and Nutmeg extracts shows significant antimicrobial, antioxidant, and anti-inflammatory properties. The formulation was effective against acne-causing bacteria such as *Propionibacterium acnes*, *Staphylococcus epidermidis*, and *Staphylococcus aureus*, and exhibited favorable characteristics in terms of pH, spreadability, and skin compatibility.

2. Singh et al. (2023): A face wash containing extracts of Turmeric, Neem, and Tea Tree Oil was formulated to target acne and other inflammatory skin conditions. The polyherbal blend demonstrated strong anti-inflammatory and antimicrobial activities, making it an effective choice for acne-prone skin. The face wash was well-tolerated and provided a gentle cleansing action.

3. Kumar et al. (2023): A face wash containing Tea Tree Oil (*Melaleuca alternifolia*) and Lemon (*Citrus limon*) provides potent antimicrobial and astringent properties. Tea Tree Oil is well-known for its ability to combat acne-causing bacteria, while Lemon helps to reduce excess oil and brighten the skin. This formulation is ideal for oily and acne-prone skin, offering deep cleansing without overdrying the skin.

4.LaRosa et al. (2023): La Roche-Posay Effaclar Medicated Gel Cleanser is effective for treating acne due to its 2% salicylic acid content. It helps control oil production and unclogs pores, which is essential for

acne-prone skin. The formulation is designed to be gentle on the skin, being free from parabens, fragrances, and oils, making it suitable for sensitive skin types.

5.Smith et al. (2023): La Roche-Posay Toleriane Hydrating Gentle Cleanser is designed for normal to dry skin and is highly regarded for its gentle cleansing properties. It contains niacinamide and ceramides, which help restore the skin barrier and retain moisture. This cleanser is also free from fragrances, parabens, and sulfates, making it suitable for sensitive skin types.

6.Singh et al. (2023): Review the benefits of a herbal face wash formulated with Aloe Vera (Aloe barbadensis) and Green Tea (Camellia sinensis) extracts. Aloe Vera is known for its moisturizing and healing properties, while Green Tea provides antioxidant benefits that protect the skin from environmental damage. This face wash is particularly effective for individuals with sensitive and irritated skin, providing a calming and hydrating effect.

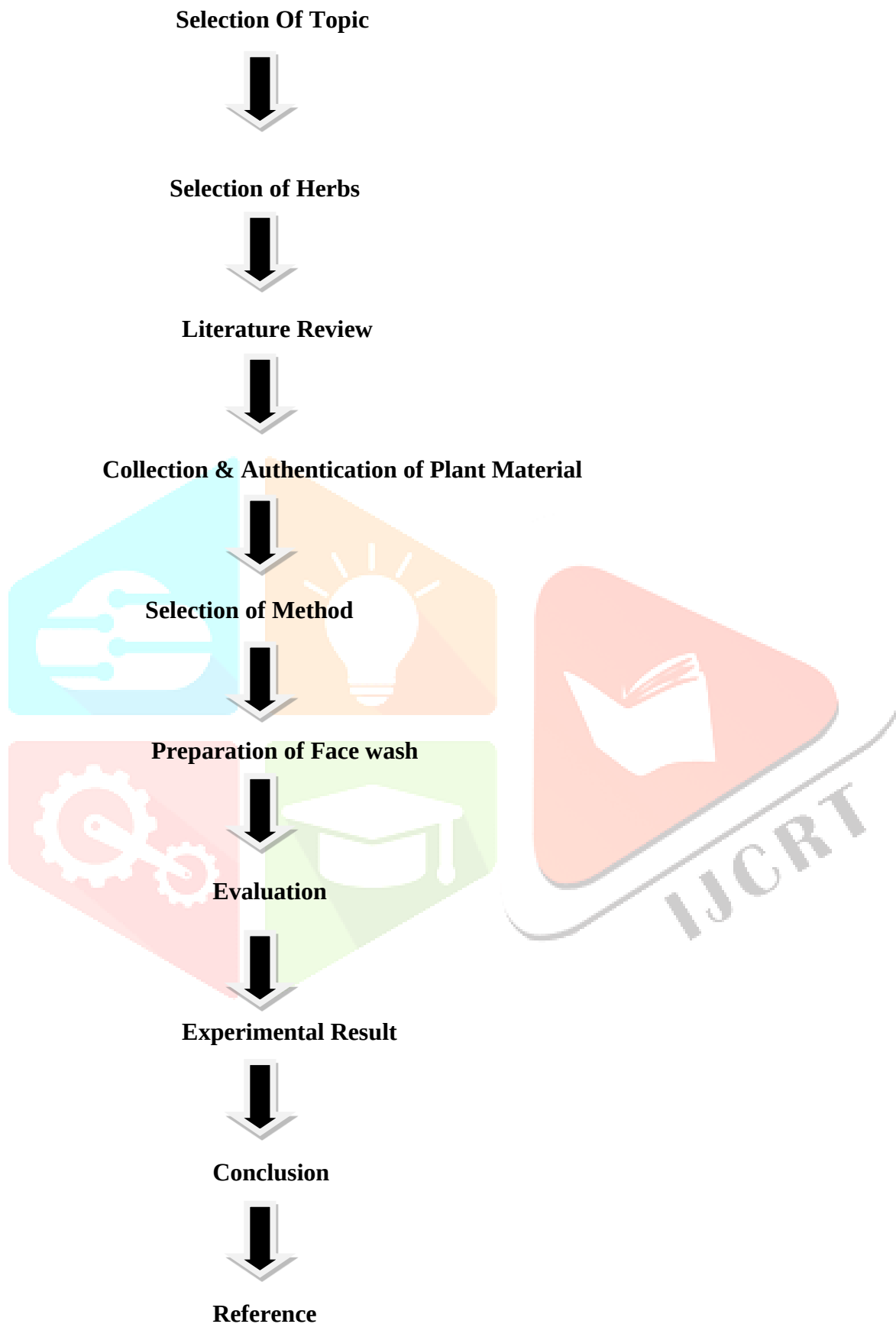
7. Kumar et al. (2022): Reviewed a polyherbal face wash incorporating extracts of Green Tea, Aloe Vera, and Chamomile. The formulation was noted for its antioxidant properties, which help protect the skin from environmental damage. The study found that the face wash was effective in cleansing, moisturizing, and rejuvenating the skin without causing irritation.

4.AIM: FORMULATION & EVALUATION OF POLY-HERBAL FACEWASH

2.OBJECTIVES OF FACEWASH

- 1. Cleaning the skin:** Removing dirt , oil , blackheads from the skin surface.
- 2. Antibacterial activity:** Anti bacterial property to reduce acne & prevent skin infection.
- 3. Purifies skin:** purifying your skin is to remove all the impurities present in the skin .
- 4. Soothing inflammation:** Reducing redness and irritation to the skin.
- 5. Enhancing skin clarity:** Promoting a brighter complexion through herbal ingredients that support the skin health.

5. PLAN OF WORK:



6.DRUG PROFILE :

1. Betel leaf



Fig2: Betel leaf

Family – Piper siriba

Common name -Piper betel, betel vine

Morphology – It has shiny heart shape leaves with small white spikes

Chemical constituent – eugenol

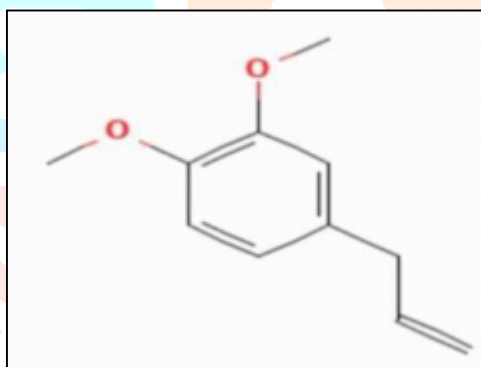


Fig 3 : Structure of eugenol

Taxanonomical information:

Kingdom – Plant

Order – Piperaceae

Genus – Piper

Species – Betel

2. Aloe vera



Fig 4 : Aloevera

Family – Asphodelaceae

Scientific name – Aloe perfoliata L

Common name – Alove barbadensis mill

Taxonomical information:

Kingdom – plant

Order – Asparagales

Genus – Aloe

Species – Barbadensis- mil

Chemical constituent : polysaccharide

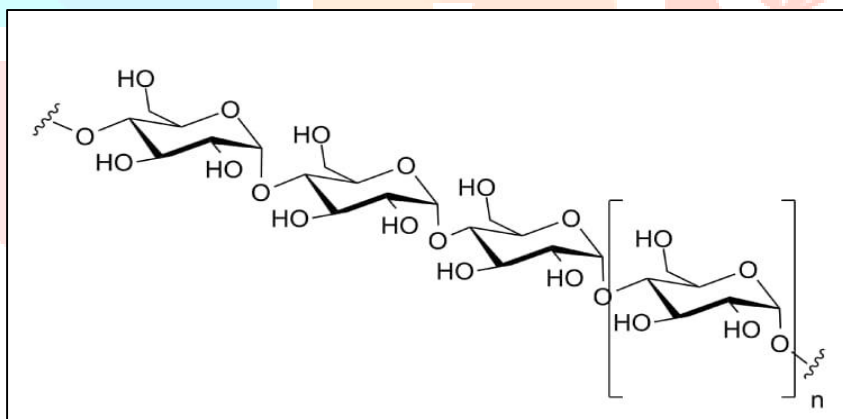


Fig5 : Structure of polysacchride

3.Reetha powder



Fig no 6: Reetha powder

Synonyms - Soap Nut Powder, Arishtakadi Powder

Biological Source - Reetha powder is obtained from the dried fruits of *Sapindus mukorossi*, which belongs to the Sapindaceae family.

Family - Sapindaceae

Chemical constituents - Saponin, sugars, fatty acids, tannis

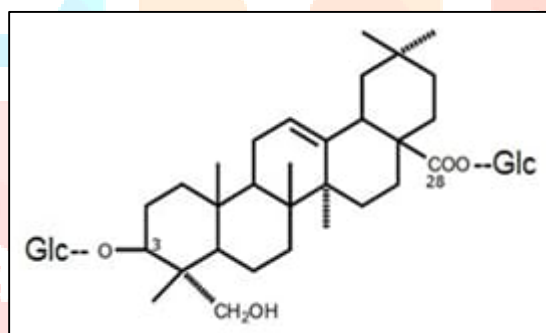


Fig 7 : structure of saponin

Why use Reetha as a foaming agent : Reetha is used as a foaming agent due to its benefits,

- 1) Reetha contains saponins, which create a rich, creamy lather.
- 2) Reetha's foaming properties are gentle on the skin, making it suitable for sensitive skin.
- 3) Reetha is a natural, chemical-free alternative to synthetic foaming agents.

7.CHEMICAL TEST OF BETEL LEAF EXTRACT :

Sr no.	Test	Observation	Inference
1	Test for alkaloid 2ml of plant extract + few drops of wagner solution	No reddish brown ppt Test is absent	
2	Boil the solution in water bath	Brown reddish ppt Test is present	
3	Test for flavonoides 2ml of plant extract + 1ml of 2N NaOH	Yellow colour show Test is present	
4	Test for tannins 2ml of plant extract + 2 drops of 5% ferric choride solution	Dark yellow colour apper Test is present	

5	Test for glycosides 2ml of plant extract + few drops concentrated H_2SO_4	Formation of faint red ppt	
6	Test for phenols 2ml of plant extract + few drops of 10% aqueous ferric chloride solution	Green colour show	

Table no : 1

8. FORMULA OF FACEWASH

BATCH : F1 Fail due to use excess amount of peppermint oil

Sr no.	Ingredients	Quantity
1	Betel lefe extract	10ml
2	Aloe vera	5ml
3	Reetha powder	1.5gm
4	Glycerin	2.5ml
5	Carbopol 934	2.0gm
6	Triethanolamine	1-2ml
7	Methyl paraben	2.4ml
8	Rose oil	5ml
9	Pippermint oil	1ml
10	Water	QS

Table no : 2

Reason : Strong irritating smell due to eye irritation is occur

BATCH : F2 fail because the adding of carbopol 934

Sr no.	Ingredients	Quantity
1	Betel leaf extract	10ml
2	Aloevera	5ml
3	Reetha powder	1.5gm
4	Glycerin	2.5ml
5	Carbopol 934	2.0gm
6	Triethanolamine	1-2ml
7	Methyl paraben	2.4ml
8	Rose oil	5ml
9	Distilled water	QS

Table no : 3

Reason : Use of extra amount of carbopol, due to the formation is not gelly form

**Fig 8 : formulation is not jelly form****BATCH : F3 because not producing foam**

Sr no.	Ingredients	Quantity
1	Betel leaf extract	10ml
2	Aloevera	5ml
3	Reetha powder	1.5gm
4	Glycerin	2.5ml
5	Carbopol 934	2.0gm
6	Triethanolamine	1-2ml
7	Methyl paraben	2.4ml
8	Rose oil	5ml
9	Distilled water	QS

Table no : 4

Reason : The small amount of reetha , due to not producing proper foam



Fig 9 : Not produce foam

BATCH : F4 Correct extract based formula

Sr no.	Ingredients	Quantity
1	Betel leaf extract	10.5ml
2	Aloevera	4.5ml
3	Reetha powder	3.5gm
4	Glycerin	4.0ml
5	Carbopol 934	2.5gm
6	Triethanolamine	Drop wise to adjust PH 5-6
7	Methyl paraben	4.2gm
8	Rose oil	10ml
9	Distilled water	QS

Table no : 6



Fig no 10 : successful formulation

9.EXCIPIENT PROFILE :

Sr no.	Excipient	Properties
1	Glycerin	Moisturizer
2	Carbopol 934	Thickening agent
3	Triethanolamine	PH adjuster
4	Methyl paraben	Preservative
5	Rose oil	Fragrance

Table no : 7

1. Moisturizer : Glycerin

Glycerin is a colorless, odorless, viscous, and sweet-tasting liquid that is soluble in water.



Fig no 11: Glycerin

2. Thickening agent : Carbopol 934

Carbopol 934 is a water-soluble, cross-linked polyacrylic acid polymer used as a thickening, gelling, emulsifying, and suspending agent.



Fig no 12: Carbopol 934

3.PH adjutant : Triethanolamine

Triethanolamine (TEA), also known as trihydroxyethylamine or tris(2-hydroxyethyl)amine, is a viscous, oily, and colorless liquid that is a common ingredient in various products like cosmetics, detergents, and pharmaceuticals.

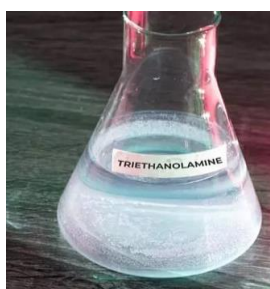


Fig no 13 : Triethanolamine

4.Preservative : Methylparaben

Methylparaben, also known as methyl-4-hydroxybenzoate, is a commonly used preservative in food, cosmetics, and pharmaceuticals. It is an antimicrobial agent that helps prevent the growth of bacteria.



Fig no 14 : Methyl paraben

5. Fragrance : Rose oil

Rose oil is a popular fragrance ingredient. Rose oil has a sweet, floral fragrance. Rose oil is often used in high-end perfumes and fragrance.



Fig 15 : Rose oil

10. METHOD OF PREPARATION :

A) PREPARATION METHOD OF BETEL LEAF EXTRACT

1. Plant Material Selection and Collection:

Select fresh, healthy and mature betel leaves.

Wash thoroughly under running water to remove dirt, pesticides & contaminants.

2. Plant material drying:

The drying process is essential for Extracting plant materials. Fresh plant material contains active enzyme that facilitate the production of active constituents & metabolic reactions. The plant material is drying by sunlight, for 1-2 days. Air drying in shaded in dark rooms is commonly employed to prevent loss of volatile substance & light sensitive constituents. Other drying methods such as, microwave drying, silica gel or salt drying & frize drying are also utilized.

3. Grinding & size reduction:

Grinding and size reduction are necessary for the soxhlet extraction process as smaller partical sizes increase the surface area of powdered particles, enhancing contact with the extraction solvent. Various methods such as hammer mills, fixed head mills are used for size reduction.



Fig no : 16

4. Size separation / sieving:

Uniform particle size is important for efficient soxhlet extraction, ensuring maximum extraction efficiency as the solvent can uniformly pass through the powdered particles. Size separations are achieved through methods to determine particle size.



Fig no : 17

5. Solvent selection for soxlet extraction:

Solvent selection for soxlet extraction is based on the phytoconstituent isolation process.



Fig no : 18

After extraction process, collect the ethanolic extract for using the formulation process



Fig no: 19

B. PROCEDURE OF FACEWASH USING ETHANOLIC BETEL LEAF EXTRACT

1. Dissolve methyl paraben in a little warm distilled water.



2. Disperse carbopol 934 in distilled water. The mortar- pestle are using the dissolution/ mixing the ingredients.



3. Add Reetha to the water with gentle stirring to avoid foaming.



4. Add glycerin, rose water, aloe vera gel and betel leaf extract.



5. Neutralize carbopol by adding triethanolamine dropwise until the gel form. & PH is around 5-6.



Fig no : 20

Fail ! This experiment was fail , because it is not a jelly form.

After the procedure, didn't produce jelly form, then in this mixture added a little quantity of carbopol 934 & glycerin



Fig no : 21



6. Make up volume with distilled water to 10ml.

7. Mix slowly to avoid air bubbles.

11.EVALUATION PARAMETER OF FACEWASH :

1. Physical evaluation : Physical parameters such as , colour , odour , appearance & consistency will be checked visually .

2. Colour : colour of our facewash is checked visually. The colour of formulation is Milky white.



Fig no : 22

2. Odour : The odour of our formulation is floral-roses .

3.pH : pH of 1% aqueous solution of the formulation will be measured by using a calibrated digital pH meter at constant temperature .The pH of skin is ranging from 5-6

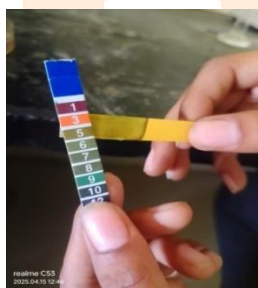


Fig no 23: pH

4. Wash ability: Formulation will be applied on the skin & then extend of washing with water will be checked manually.

5. Spreadability : spreadability refers to the product can be spread over a surface, especially to the skin or a affected part . The spreadability is expressed in terms of time in seconds taken by two slides to slip off from the face wash , under certain load . Lesser the time for separation of two slides , better the spreadability .



Fig no 24 : spreadability apparatus

6. Appearance: It was observed visually.

7. Nature: It was observed visually.

8. Foam ability: small amount of formulation will be taken in a beaker containing water. Initial volume will be noted, beaker will be shaken for 10 times and the final volume will be noted.



Fig no 25: foamability

12: PACKAGING AND LABEING OF PRODUCT :

A) PACKAGING OF PRODUCT :

The packaging and labeling of face wash products involve following steps:

- 1) Container selection : Choose a suitable container (bottle , tube or jar) that is clean , dry and free of contaminants.
- 2) Filling : Fill the container with the face wash product , leaving adequate space for labeling and capping .
- 3) Capping : Securely cap the container to prevent leakage or contamination.



Fig 26: packaging of product

- 4) Labeling: Apply labels or packaging inserts with product information , ingredients and instructions.

B) LABELING OF PRODUCT :**FORMULATION AND EVALUATION OF POLY-HERBAL FACEWASH (50ml)****INGREDIENTS:**

1. Betel leaf extract - 10.5 ml
2. Aloevera -4.5 ml
3. Reetha -3.5 ml
4. Glycerin -4.0 ml
5. Carbopol 934 -2.5 gm
6. Triethanolamine -to adjust pH
7. Methyl paraben -4.2 gm
8. Rose oil -10 ml
9. Distilled water - QS

MRP: 60/-**Mfg date: 3/25****Exp date: 2/27****Net vol: 50ml****DIRECTION: FOR EXTERNAL USE ONLY****STORAGE: Store in cool and dry place****Mfg by- Mrs.saraswati wani college of pharmacy****12.RESULT :**

The formulated poly herbal face wash was evaluated at different parameters.

All the organoleptic properties were checked visually such as , colour , odour , PH , foamability , spreadability , wasgability , Apperance and nature . As a result, the colour of Formulation is **Milky white**, No bad smell occurred from the formulation. washbility and cleansing properties of aloe vera was found to be good and it is easily removed by washing with normal water . it left a smooth feel on the skin after washing and no dryness was observed . Spredability quantity was also tested with the help of glass plate and was easily spreadable when compared with a marketed gel based face wash. No irritation, redness or any dermatological effects were observed on skin during irritancy testing.

Sr no.	Test	Result
1	Colour	white
2	Odour	Floral roses
3	Appearance	Smooth
4	Nature	Smooth
5	pH	5-6
6	Foamability	Good
7	Washability	Easily wash
8	Spredability	Easily spared

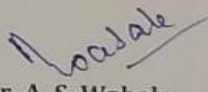
13. Authentication certificate:


Estd. 1971

LOKNETE DR. BALASAHEB VIKHE PATIL
(PADMA BHUSHAN AWARDEE)
PRAVARA RURAL EDUCATION SOCIETY'S
**PADMASHRI VIKHE PATIL COLLEGE OF ARTS,
SCIENCE AND COMMERCE,**
PRAVARANAGAR A/P-LONI KD. TAL-RAHATA, DIST-AHILYANAGAR (MS)
POST GRADUATE DEPARTMENT OF BOTANY AND RESEARCH
CENTRE

Authentication Certificate

This is to certify that the plant specimen collected by Ms. Tagad Shraddha Govind, Ms. Lambhe Sonali Pandit and Ms. Bhosale Kalyani Ashok, Students of B. Pharmacy of Mrs. Saraswati Wani College of Pharmacy At. Ganegaon, Po. Guha, Tal Rahuri Dist. Ahilyanagar is *Piper siriboa* L. and belongs to family Piperaceae with local name Betel Leaf.

<u>Identified by</u>  Dr. S. P. Giri Research Guide Dept. of Botany and Research Centre PVP College, Loni	<u>Verified by</u>  Dr. A. S. Wabale Research Guide, Vice Principal and Head Dept. of Botany and Research Centre PVP College, Loni
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Date: 21st Jan. 2025
Place: Pravaranagar
Ref. No./PVPC/Bot./2024-25/365



14. Conclusion :

The formulated polyhedral face wash has proven to be effective and natural skincare product. It is composed of herbal ingredient such as, aloe vera & betel leaf, which possess well-known cleansing and skin nourishing properties. The evaluation parameter indicates that the face wash is physically stable, non irritant and easy to wash, leaving the skin feeling smooth and refreshed . As it is free from harmful chemicals commonly found in synthetic cosmetics, this formulation serves as a safer and more skin-friendly alternative. Overall, the polyhedral face wash can be recommended as a mild, natural and effective skincare solution suitable for regular use.

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