

A Review on Polyherbal Face Wash Formulations Incorporating Ayurvedic and Natural Ingredients For Skin Health and ACNE Management

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Abstract- The goal of this work is to create a herbal face wash using natural herbs such as neem, orange, tulsi, rose, honey, almond oil, aloe vera gel, lemon grass, banana peel, rice flour, and linseed. The resulting face wash was evaluated for colour, consistency, pH, washability, homogeneity, viscosity, stability studies, grittiness, and skin irritability. And the outcomes were consistent with the face cleansers on the market; the specifics are covered in the study.

Natural medicines are more acceptable because people believe they are safer and have fewer adverse effects than manufactured ones. Herbal formulations are becoming increasingly popular in the global market. The current study focusses on the formulation and evaluation of a herbal anti-acne face wash containing an aqueous extract of neem leaves (*Azadirachta indica*), turmeric (*Curcuma longa*), liquorice root, shahi jeera, orange peel, and a hydroalcoholic extract of nutmeg fruit (*Myristica aroma*). Although there are several topical herbal formulations for acne on the market, we recommend creating a pure herbal formulation that contains no synthetic ingredients. The plants have been shown in the literature to have good antimicrobial, antioxidant, and anti-inflammatory properties. It was an excellent attempt to develop a natural anti-acne face wash containing an aqueous extract of neem leaves and turmeric.

Keywords: Neem, Xanthan gum, herbal ingredients, anti-acne face wash, face wash, Natural herbs.

I. INTRODUCTION

The term "cosmetics" is derived from the Greek word "kosmetikos," which meaning to "adorn" (adding of anything ornamental to a person or object). Materials used for beauty or improvement of appearance have long been classified as cosmetics. People want to look beautiful, and the concept of cosmetics is as old as humanity and civilisation.

Since the time of the tribes, people have been driven to enhance their physical appearance. Various cosmetics, including hair, nail, oral hygiene, skincare, and fragrance items. (11)

Cosmetics are products used to beautify, cleanse, or improve the appearance of the body, as well as to enhance attractive traits. (12)

Definition :

A face wash is a kind of cleanser for the face that is made especially to get rid of impurities such as dead skin cells, oil, dirt, and makeup. They can also be eliminated with a face wash, albeit its effectiveness may not be 100%.

Products that cleanse your face without drying it out are called face washes. It is also frequently referred to as "cleanser." It has been demonstrated that this product is suitable for all skin types. A cleanser removes extra oil, makeup, and dirt from your face. In oil, these contaminants dissolve. They can also be eliminated with a face wash, albeit it might not be completely successful. Regular soaps may dry up the sensitive skin on the face. A face wash is a personal hygiene product that cleanses the face of debris, oil, dead skin cells, makeup, and other contaminants. This aids in pore clearance and shields the skin from conditions like Acne.

Types of cosmetics :

1. According to region -

1. Skin: powder, lipstick, Rouge, Lotions, etc.
2. Hair: - Shampoo, conditioners, Bleach, creams, colouring preparation, dye, air, Spray etc.
3. Nails: Nail paint, nail paint removers, etc.
4. Teeth: powder, paste, gel and dentifrices etc.
5. Eye: Eye eyeliner, mascara, eyeshadows and eyebrow pencil.

2. According to function -

1. Emollient preparation: - cold creams, Vanishing creams Foundation Creams, lotions and solutions, etc.
2. Cleansing preparation: - Shampoo, face wash, body wash, hand wash, Soaps, etc.

3. Decorative preparation: -Lipsticks, Rouges, eyeliner, lacquers and dressing preparation.
4. Deodorant / Antiperspirant: - Spray Sticks and mouthwashes.
5. Protective preparation: - Sunscreen, Creams, powders.
6. Preparation for enjoyment: - Salts. Powders oils and milk.

3. According to compositions –

1. Powder
2. Lotions
3. Emulsions
4. Solutions
5. Suspension
6. cream
7. paste
8. Gels
9. Aerosol
10. Sticks
11. Pencils etc.

The skin makes up to 15% of the body’s total weight, making it the biggest organ. Skin serves a variety of virtual purposes. Protecting the body from physical, chemical, biological, and external threats; preventing the body from losing too much water; and playing a part in thermoregulation. (16)

A balanced diet is necessary to maintain healthy, clear, and shiny skin. In addition, hormonal changes, particularly during adolescence in both sexes, induce several physical changes. (17) Cosmetics and the gifts of natural beauty aid in showcasing and enhancing individual beauty and personality. For a healthy life, individuals of days prefer natural foods, herbal remedies, and natural healing methods. (18) Herbal cosmetics are preparations that contain phytochemicals from various botanical sources that affect skin function and supply the nutrients required for healthy skin. (19) Natural herbs and their products are referred to as herbal cosmetics when they are utilised in cosmetic preparations because to their aromatic value. (20)

Function of the face wash:

- Oily skin requires cleansers with herbs and botanicals, which will clean the pores and reduce oil buildup.
- It should be stable and have a good appearance.
- During application, it should not have an oily or greasy feel.

- After the evaporation of water, the cream residue should not become viscous.
- It should spread easily without draggaing .

Different types of face wash :-

1. Gel based face wash.
2. Cream based face wash.
3. Liquid based face wash.
4. face wash in powder form.

These different types of face wash available in the market include :

1. Oily skin face wash.
2. Dry skin face wash.
3. Normal skin face feature of the face wash.

Benefits of face wash :

1. It facilitates the replacement of aged skin cells by removing dead skin cells.
2. It keeps skin healthy and fresh.
3. It gives the skin a glowing appearance.
4. Excessive oil and dead skin cells clog pores, resulting in blackheads, whiteheads, and a generally exhausted appearance. Regular pore Exfoliation helps prevent all of the aforementioned skin issues.
5. Eliminating dead skin cells will cause wrinkles to appear more slowly.
6. They are typically gentler on the skin, contain fewer harsh chemicals, and harness the properties of botanicals to address specific skin concerns like acne, dryness, and inflammation.
7. Overall, using an herbal face wash can lead to healthier, clearer, and more radiant skin by harnessing the power of nature for effective and gentle skincare.

Classification Based On Formulation Base/Physical Form :

Types	Description	Examples/ Ingredients
Gel-based face Wash	Transparent or translucent gels;mild surfactants; suitable for oily/ normal skin.	Neem ,Tea tree, Citrus Extracts

Cream-based Face wash	Emollient-rich, moisturizing; non-foaming ; ideal for dry/ sensitive skin.	Honey, Aloe vera, Rose, Shea butter
Foaming Face wash	High surfactant content; strong cleansing; for oily /acne- prone skin.	Lemon, Turmeric, Charcoal
Scrub-based face wash	Contains exfoliating particles to remove dead cells.	Walnut shell, Rice flour, Oats
Clay-based face Wash	Absorbs oil and toxins; detoxifies pores.	Multani mitti (fuller's earth), Bentonite, Kaolin
Powder/ dry face wash	Activated by adding water; often herbal or Ayurvedic.	Rice flour, Turmeric, Gram flour (besan)
Micellar face wash	Uses micellar technology; gentle cleansing without rinsing; suits sensitive skin.	Rose water, cucumber extract
Herbal/ Ayurvedic face wash	Uses natural plant extracts; mild surfactants or soap- free base.	Neem, Turmeric, Aloe vera, tulsi
Medicated face Wash	Contains therapeutic actives for acne, pigmentation, etc.	Salicylic acid, benzoyl peroxide, Niacinamide.

Classification Based On Function /purpose :

Purpose	Target use	Common Herbal / active Ingredients
Antibacterial / anti-acne	Reduces pimple, bacterial growth	Neem, turmeric, tea tree oil, Basil
Exfoliating /scrubbing	Removes dead skin, improves glow	Walnut, rice Flour, Orange peel, Oatmeal
Whitening /Brightening	Reduces pigmentation, enhances glow	Lemon, Licorice, Orange peel, Rice Extract
Moisturizing/ hydrating	Prevents dryness, nourishes skin	Honey, aloe, Vera, Rose, coconut milk
Anti-aging	Improves elasticity, reduces	Tuemic, rose, licorice, Vitamin E

	wrinkles	
Detoxifying / Charcoal - based	Removes impurities / pollution residues	Activated charcoal, Clay, neem
Soothing/ Calming	Reduces irritation, redness	Cucumber, rose water, Chamomile, aloe vera
Tanning Removal/Fairness	Removes suntan, evens tone	Lemon, Orange peel, rice flour, Turmeric

Examples of Herbal Ingredients for each function :

Function	Herbal Actives Used
antibacterial	Neem, Turmeric, Tulsi, Tea tree
Moisturizing	Honey, Aloe vera, rose < Glycerin
Exfoliating	Walnut shell, Rice Flour, Orange peel
Brightening	Lemon, licorice, Orange peel, Turmeric
Soothing	Cucumber, Rose, Aloe Ver
Astringents/ pore tightening	Lemon, Orange peel, Witch hazel

Characteristics of face wash :

1. Dead cells should be eliminated.
2. It ought to revitalise the cells of the skin.
3. It ought to eliminate contaminants, oil, and grime.
4. It should be able to lower the skin's microbial flora.
5. Keep the skin breathing and fresh.
6. It should be simple to wash off.
7. It shouldn't cause irritation.

Advantages of face wash:

1. It helps to remove dead skin cells that helps new skin cells replace old one.
2. It helps to keep skin fresh and healthy.
3. Removing dead skin cell that means your skin will develop wrinkle at slower pace.

Disadvantages of Face wash :

1. **Over-drying and depleting natural oils :** A lot of cleansers can deplete the skin of its natural oils, particularly foamy or very alkaline ones. Dryness, stiffness, and flakiness may result from this.
2. **Disruption of the skin's protective barrier :** The skin's natural barrier function may be compromised

- by aggressive or excessive washing, leaving it more susceptible to infections and environmental irritants.
- Redness, itching, and general sensitivity can be brought on by harsh substances, perfumes, and extreme temperatures.
 - Allergic reactions:** Some people may experience allergic reactions to specific substances.
 - Increased oil production:** If the skin is overstripped, it may produce more oil to make up for it, which can be detrimental, particularly for people with oily skin.
 - Damage from abrasive tools :** Over-exfoliating the skin with hard cloths or exfoliating brushes can cause irritation, redness, and damage.
 - Using a cleanser that isn't designed for your skin type can lead to problems. For instance, a creamy cleanser may be too heavy for oily face, while a harsh foamy cleanser may be too drying for dry skin.
 - Over-washing :** Rinsing your face more than twice a day can cause dryness and irritation by removing natural oils.

PROPERTIES OF FACE WASH –

- It should remove dead cells .
- It should rejuvenate the skin cells .
- It should remove oil, dirt and impurities.
- It should be able to reduce microbialflora of skin.
- Leave skin fresh and breathing.
- It should be washed off easily.
- It should not have irritating effect.

LIST OF INGREDIENT -

1. NEEM

- Scientific name** - Azadirachta Indica
- Family** - Meliaceae
- Odour** - Sapindales
- Higher classification** - Azadirachta
- Kingdom** – plantae
- Genus** - Azadirachta



Fig : 1

Properties :

- Neem's antibacterial qualities combat microorganisms that cause acne, aiding in both its prevention and treatment.
- It is very helpful in regulating the skin's production of oil.
- Fight against the indications of ageing.
- Soothe skin irritation.
- Pacify irritated skin.
- Its extremely useful in controlling oil production in the skin .
- Tackles black heads and white heads.

2. ORANGE PEEL

- Scientific name** – citrus aurantium dulcis
- Family** - Retaceae
- Odour** - Sapindales
- Kingdom** – plantae
- Genus** - Citrus



Fig : 2

Properties :

- Prevent skin damage from free radicals.
- It hydrates dehydrated skin and soothes dry, flaky, and irritated skin.
- Restores the moisture.
- keeps skin cells looking young and radiant.
- It can be maintain the natural balance of skin oils and tighten the skin by absorbing excess oils and removing dead cells .

3. ROSE

- **Scientific Name** – Rosa
- **Family**- Rosaceae
- **Odour** - Rosales
- **Kingdom** - plantae
- **Genus** – Rosa



Fig : 3

Properties:

- It is used to enhance the appearance of the skin and has anti allergic, antiseptic, and flavouring properties.
- It Is Used To Beautify The Skin.
- It Is Used As Antibacterial.
- As an antidepressant, it is utilised.
- Used as solvent – its also has anti bacterial and antiseptic properties which eventually cure acne.

4. HONEY

It is produced from the bees.

- **Family** - Apidae
- **Odour** - Hymenoptera
- **Kingdom** - Animalia
- **Phylum** - Arthropoda
- **Class** - Insecta



Fig : 4

Properties :

- Light humectant and nutrient used as a thickening agent to give body to facial masks, creams and lotion.
- Smoothens skin and hair.
- Light humectant and nutrient used as thickening agent to give body to facial masks creams and lotion.

5. TURMERIC

- **Scientific name** - Curcuma longa
- **Kingdom** - Plantae
- **Phylum**- Streptophyta
- **Class** - Equisetopsida
- **Subclass** - Magnoliidae
- **Odour** - Zingiberales
- **Family** - Zingiberaceae
- **Genus** - Curcuma



Fig :5

Properties :

- Antibacterial, antifungal and It protects the skin from many skin infection and also adds glow to the face.
- Its special active properties are antioxidant, anti inflammatory, antiseptic, anti microbial and anti cancer.
- It protect the skin from many skin infection and also adds glow tto the face.

6. LEMON GRASS

- **Scientific name** – Cymbopogon citratus
- **Family** - poaceae
- **Odour** - poales
- **Kingdom** - Plantae
- **Genus** - cymopo



Fig :6

Properties :

- Lemon grass is an herb with significant antioxidant, anti- inflammatory, antibacterial, fungal properties .
- Treat oily skin.
- Its treating acne and pimples.
- To lighten skin and reduce blemish marks on the skin.

7. ALOE- VERA GEL

Its Is Produced From Aloe – Vera.

- **Scientific name** – Aloe barbadensis miller
- **Family** - xanthorrhoeaceac

- **odour** - Asparagales
- **Kingdom** - Plantae
- **Genus** - Aloe



Fig : 7

Properties :

- Heal Aging.
- Lightens Scars And Blemishes.
- Treat Dry Skin.
- Treat Stretch Marks.

8. RICE FLOUR

- **Scientific name** - Oryza sativa
- **Family** - Poaceae
- **Odour** - poales
- **Kingdom** - plantae
- **Genus** – oryza



Fig : 8

Properties:

- Prevent Skin Aging .
- Reduce Uv Damage.

- Promote Skin Lightening.
- Natural Exfoliant.

9. NUTMEG SEED

- **Scientific Name** - Myristica Fragrans Houtt
- **Family** - Myristicaceae
- **Odour** - A Blend Od Warm, Sweet, Woody,Spicy, And, Slightly Nutty Notes , With Hints Of Citrus And Pine.
- **Kingdom** - Plantae
- **Genus** - Myristica



Fig : 9

Properties :

- Help reduce body inflammation.
- Protects teeth and gums.
- Helps digestion and gas .

10 LIQUORICE ROOT

- **Scientific name** - Glycyrrhiza glabra
- **Family** - Leguminosae
- **Odour** - sweet, slightly spicy
- **Kingdom** - plantae
- **Genus** - glycyrrhiza



Fig : 10

Properties :

- Delivers valuable soothing properties to the skin.
- Highly rejuvenating and nutritive qualities are attributed to it.
- Delivers valuable soothing properties to the skin.
- Highly rejuvenating and nutritive qualities are attributed to it.

11. SHAHI JEERA

- **Scientific Name** - Bunium Persicum
- **Family** - Apiaceae
- **Odour** - Aromatic
- **Genus** - Bunium



Fig : 11

Properties :

- It Is Used As Perfum.
- Providing Antioxidant,Which Protect The Skin From Free Radical .

12. XANTHAN GUM



Fig : 12

Properties :

- A gum produced by the pure culture fermentation of a carbohydrate also called Corn Sugar Gum. It is used as a non-toxic thickener and stabilizer.
- Xanthan gum is a polysaccharide known for its high viscosity at low concentrations, unique pseudoplastic (shear-thinning) behavior, and excellent stability across a wide range of temperatures, pH levels, and salt concentrations. It is highly soluble in both cold and hot water but poorly soluble in most organic solvents, and it functions as a powerful thickener, emulsifier, and stabilizer.

13. WALNUT

- **Scientific name :** juglans regia
- **Family :** juglandaceae
- **Odour :** sweet, mildly nutty aroma.
- **Genus :** juglans



Fig : 13

Properties :

- Scrubbing action of walnut granules helps break up The mild oil deposits and clear away dead skin cells and debris.
- Walnut oil is excellent for fighting several skin problems like dark spots, hyperpigmentation, acne, and wrinkles. The antioxidants and vitamins in walnuts help to reduce acne, remove hyperpigmentation and tighten the pores.
- The proteins in walnuts also help lock in moisture, preventing water loss and maintaining a soft and supple complexion.1 Mar

PREPARATION OF HERBAL FACE –WASH

1. COLLECTION –

Herbs and Chemicals which were used in the present study were collected from local area and Purchased from the market.

1. Neem leaves
2. Orange peel
3. Rose
4. Honey
5. Turmeric
6. Lemon Grass
7. Aloe- vera gel
8. Rice flour
9. Nutmeg seed
10. Liquorice root
11. Shahi jeera
12. Xanthan gum
13. Walnut

2. PREPARATION OF HERBAL EXTRACTS –

Neem leaves, liquorice roots, turmeric rhizomes, and orange peel , Rose, lemon grass, were dried at 45°C in a hot air oven and then ground into small pieces using a grinder. Nutmeg and shahi jeera (cumin) seeds were ground into a powder. Then extract of each herb was made with the help of Distilled water or rose water and kept them in which were the conical flasks. Were Shaked for 3days separately . After 3 day contents were filtered out by using Simple filtration method and filtrate were collected in vessels separately and then evaporated in water bath and a concentrated Solution was made.(2)

2. FILTRATION

Filtration of extract was done by using simple filter Paper And Funnel For Two Times.

3. EVAPORATION

Evaporation was done by using electronic water bath. Filtrates were allowed to evaporate in evaporating pan at 60°C temperature until the desired concentration of the extract was obtained.

5. DEVELOPMENT OF FORMULATION

Various formulation batches were prepared according to the list of ingredients . The desired concentration of gelling agent i.e. xanthium gum was weighed accurately and dispersed in hot rose water (not more than 60°C; 50 % weight of the batch size) with moderate stirring, avoiding air entrapment and allowed to soak overnight. Desired quantity of lemon juice was dissolved in desired amount of honey by gentle stirring. Desired quantity of concentrated herbal extracts were added to the remaining amount of rose water and mixed with above honey mixture by gentle stirring. This was finally mixed with previously soaked gel formulation. Prepared formulations were filled in a suitable container and labeled accordingly . (1,2)

COMPOSITION OF DEVELOPED FORMULATION :

Sr.no	ingredient	Quantity taken for 10g gel				
		F1	F2	F3	F4	F5
1.	Neem extract	0.5ml	0.5ml	0.5ml	0.5ml	0.5ml
2.	Orange peel extract	0.1ml	0.1ml	0.1ml	0.1ml	0.1ml
3.	Rose water	q.s	q.s.l	q.s.	q.s.	q.s.
4.	Honey	0.5ml	0.5ml	0.5ml	0.5ml	0.5ml
5.	Turmeric extract	0.2ml	0.25ml	0.5ml	0.2ml	0.2ml
6.	Lemon juice extract	0.1ml	0.1ml	0.1ml	0.1ml	0.1ml
7.	Aloe-vera gel	0.1ml	0.1ml	0.1ml	0.1ml	0.1ml

8.	Rice flour	0.1ml	0.1ml	0.1ml	0.1ml	0.1ml
9.	Nutmeg extract	0.5ml	0.25ml	0.5ml	0.25ml	0.25ml
10	Liquorice extract	0.25ml	0.25ml	0.25ml	0.25ml	0.25ml
11.	Shahi jeera extract	0.1ml	0.1ml	0.1ml	0.1ml	0.1ml
12.	Xanthan gum	0.05g	0.1g	0.15g	0.02g	0.01g
13.	Exfoliating walnut granules	q.s.	q.s.	q.s.	q.s.	q.s.

EVALUATION OF FORMULATION

Physical evaluation -

Physical characteristics like colour, consistency, and appearance were visually examined.

1. Washability –

Formulation were applied on the skin & then ease & extent of washing , with water were Checked manually.

2. PH –

A calibrated digital pH meter was used to measure the pH of a 1% aqueous solution of the formulation at a steady temperature [5].

3. Spreadability –

Spreadability is the degree to which the gel easily spreads after being applied to the skin or the afflicted area. The spreading value of a gel formulation affects its bioavailability efficiency [2]. The spreadability is measured in the number of seconds it takes for two slides to separate from the gel that is positioned between them under a specific stress. Better spreadability is achieved with less time spent separating two slides. Two sets of standard-sized glass slides were collected. One of the slides was covered with the herbal gel mixture. The gel was sandwiched between the two slides at a distance of six centimetres along the slide after the other slide was positioned on top of the gel. The gel between the two slides was uniformly compressed into a thin layer by applying a 100g weight to the upper slide. The extra gel that was stuck to the slides was scraped off after the weight was taken off.

The two slides were positioned so that only the upper slide could slip off easily due to the force of the weight attached to it, and they were fastened to stand without any disruption. Carefully, a 20g weight was fastened to the upper slide. It was recorded how long it took the higher slide to move 6 cm away from the lower slide while being affected by the weight. The experiment was conducted three times using both marketed and formulated gels, and the average computation time was recorded [1,2].

Spreadability was calculated by using the following formula, $S=M \times L/T$

Where, S – Spreadability

M- Weight tied to the upper slide (20gm).

L- Length of the glass (6.5cm).

T- Time in sec .

II. CONCLUSION

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal formulations have growing demand in the world market. It is a very good attempt to establish the herbal face wash containing aqueous extracts of neem leaves, turmeric rhizomes, liquorice root, and seed of nutmeg etc . Because natural medicines are thought to be safer and have less adverse effects than synthetic ones, they are more widely accepted. The need for herbal formulations is rising globally. The herbal face wash, which contains aqueous extracts of neem leaves, turmeric rhizomes, liquorice root, nutmeg seeds, etc., is an excellent attempt.

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