



# Formulation and Evaluation of Semi-synthetic Anti-acne Face wash

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## ABSTRACT:

People have been concerned about acne, pimples, and cyst acne, which is a prevalent problem among teenagers and adults as a result of their daily lives. To keep clear skin, use a hygiene routine that includes face wash, scrub, and moisturizer. After being used for a long time by individuals all over the world, chemical-based formulations have shown a wide range of negative effects. Herbal treatments, on the other hand, have been utilized in India since ancient times and have never caused any serious side effects. India is abundant in herbs and spices such as aloe vera, turmeric, and many others. The present research was aim to formulate and evaluate the Semi-synthetic Anti-acne Face wash. Based on the findings, we can conclude that all three formulations, Fnh1, Fnh2, and Fnh3, are stable and can be used on the skin without risk.

**Keywords:** Semi-synthetic anti acne face washes, Cinnamon, Nutmeg, Maceration, Evaluation test.

## INTRODUCTION

Acne is a skin disorder that occurs when oil, dirt, or dead skin clogs hair follicles, resulting in whiteheads, blackheads, cysts, and pimples. Acne can cause emotional anguish as well as scarring on the skin, depending on its severity. Acne is most common on the face, forehead, cheeks, chin, upper back, and shoulders since these are the areas with the most sebaceous oil glands<sup>1</sup>. When blocked hair follicles become irritated or infected with germs, pimples appear as red patches with a white core. Cystic lumps appear beneath the surface of your skin as a result of obstruction and inflammation deep within hair follicles. The skin, being the outermost and most exposed organ, protects and performs critical functions such as shielding against dangerous UV rays, producing vitamin D, regulating body temperature, and acting as a barrier against mechanical, physical, and thermal traumas.

Pollutants such as polycyclic aromatics, hydrocarbons, volatile organic compounds, oxidants, particulate matter, and cigarette smoke have recently increased in concentration, causing skin irritation, redness, skin allergies, acne, and skin cancer. It is a leading cause of poor skin health in both children and adults. Although a wide range of cosmetic dermatologist-recommended products are available on the market, many people avoid using chemical-based face wash because of the side effects that can occur after prolonged use. As a safer alternative, India's bio diversity, herbs, and spices can meet the need for herbal-based face wash, providing healthy skin for everyone.

### **Acne is caused by the following factors:**

- Excessive oil production.
- Bacterial infection.
- Unhealthy eating habits or a sedentary lifestyle.
- Changes in hormones.
- Stress.
- Aspects of the environment.



### **Face wash:**

A face wash (facial cleanser) is an essential skincare product in everyone's daily skincare routine. Face washes work to clean out clogged pores by removing dead skin cells, dirt, oil, sweat, sebum, make-up, and other pollutants from your skin. A face wash is a liquid that is used to cleanse our faces instead of traditional soap. Many compounds have been developed by businesses to provide a more modern alternative to soap for cleaning our skin, particularly our faces. A face wash is a foamy solution that is used to remove deep-seated filth and grime, leaving people feeling clean and refreshed.



### **Advantages of semi synthetic face wash:**

- They are devoid of or have little side effects, and they also help to totally reduce skin damage and dryness.
- The semi-synthetic face cleanser is quite effective in treating skin irritation.
- They don't include any synthetic or hazardous additives.
- They also provide nutrients to all skin types.

### **Disadvantages of face wash**

- In addition to containing dyes and perfumes that can irritate and exacerbate acne
- Sometimes too harsh can result in excessive drying of the skin, which leads to overcompensation by the oil glands and ultimately to more oil on the surface of the skin<sup>2</sup>.

Our primary goal is to develop a semi-synthetic face cleanser that is both pleasant and effective. In our manufacturing process, we used polyherbal substances including

- **Cinnamon:** Cinnamon has antifungal, antioxidant, and antibacterial qualities, making it an excellent acne treatment.
- **Nutmeg:** Nutmeg has anti-inflammatory reduce irritation of skin also help in balancing oily skin.
- **Lemon:** Lemon has antioxidant, anti-microbial, and also kills harmful viruses.
- **Honey:** honey has anti-bacterial, antiseptics abilities also moisturize skin.
- **Peppermint oil:** Peppermint oil has menthol in it. It provides cool feeling and freshness along with anti – inflammatory and fragrance properties.

#### ❖ Cinnamon



**Fig no.1 Cinnamon**

**Scientific name:** Cinnamomum verum

**Family:** Lauraceae

**Class:** Magnoliopsida

**Order:** Laurales

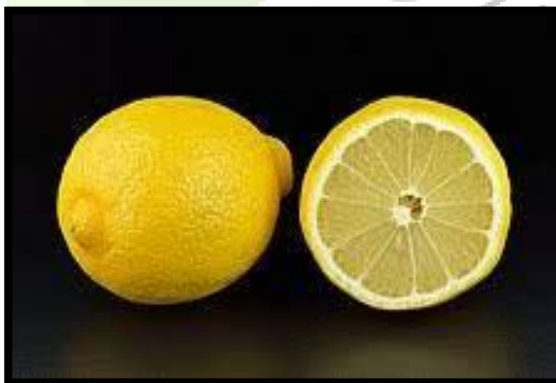
**Kingdom:** Plantae

**Extraction Method:** Maceration

## ❖ Nutmeg

**Fig no.2 Nutmeg****Scientific name:** Myristica**Family:** Myristicaceae**Class:** Magnoliopsida**Order:** Magnolipsida**Kingdom:** Plantae**Extraction Method:** Maceration

## ❖ Lemon:

**Fig no.3 Lemon**

**Scientific name:** Citrus limon

**Family:** Rutaceae

**Class:** Magnoliopsida

**Order:** Sapindales

**Kingdom:** Plantae

**Extraction:** Juice extraction

## **MATERIALS AND METHODS**

### **1.1 Collection of plant material:**

Nutmeg, cinnamon, honey, lemon juice, and paper mint were purchased from a local market in Kasegoan and Karad, while methyl paraben, sodium laury sulphate and xanthan gum were provided by the department of chemical supplies<sup>3</sup>.

### **1.2 Formulation preparation**

Using a grinder machine, the collected nutmeg and cinnamon were broken down into smaller acceptable particle matter, and the required powder was collected separately. Then a precise amount of nutmeg and cinnamon powder was added to distilled water in a conical flask and moderately shaken for three days inside an airtight bottle. We employed a method called maceration (Maceration is an extraction technique that takes place at room temperature.) It entails submerging an active substance in a liquid (water, oil, alcohol, etc.) inside an airtight container for a specific amount of time, depending on the contents and liquid utilized<sup>4</sup>.

**Table no.1 Formulation table for face wash**

Sr. no.	Ingredients	Fnh1 Batch	Fnh2 Batch	Fnh3 Batch	Role
1.	Cinnamon	5 ml	4 ml	3 ml	Antibacterial
2.	Nutmeg	3 ml	4 ml	5 ml	Bactericidal
3.	Peppermint oil	0.5 ml	0.5 ml	0.5 ml	Provide cooling effect
4.	Lemon juice	2.5 ml	2.5 ml	2.5 ml	Help to lighten the skin
5.	Honey	5 ml	5 ml	5 ml	Thickening agent
6.	Xanthan gum	1 ml	1 ml	1 ml	Thickening agent
7.	Methyl paraben	0.05	0.05	0.05	Preservative
8.	Propyl paraben	0.03	0.03	0.03	Preservative
9.	Sodium lauryl sulphate	1.50	1.50	1.50	Foaming agent
10.	Purified water	q.s.	q.s.	q.s.	Vehicle

**1.3 Filtration:**

After 3 days, the nutmeg and cinnamon were filtered 3 to 4 times with regular filter paper and the filtrate was collected.

**1.4 Evaporation:**

To acquire a certain concentration, the collected filtrate was maintained on a water bath at 60-70°C for 2 to 3 hours. The resulting concentration was then collected and chilled before adding other ingredients.

**1.5. Conceptualizing the final product:**

To make the formulation, several batches are made, each with a different amount of cinnamon and nutmeg as listed in the table. Then the desired amount of xanthan gum (which was allowed to soak overnight), honey, paper mint oil, methyl paraben, and sodium Laury sulphate are added slowly while gently stirring. After that, the created mixture is placed in the suitable container.

**1.6 Evaluation of formulation:**

The following parameters are used to evaluate the prepared face wash<sup>5-6</sup>:

### 1. Physical parameters:

Physical factors include odor, color and texture of formulation state.

### 2. pH:

The pH scale is used to specify the acidity or basicity of a product in order to ensure that it is safe to use.

### 3. Consistency:

The state of a formulation when applied to the skin is called consistency.

### 4. Viscosity:

Brookfield viscometer is used to determine the viscosity of the formulation. The value obtained is recorded.

### 5. Spread ability:

Spread ability refers to the amount of gel that spreads easily when applied to the skin or afflicted area. The spreading value of a gel formulation affects its bioavailability efficiency. The spreadability is measured in seconds required by two slides to slip away from the gel, with a third slide inserted in between them a specific load. The spreadability improves as the time it takes to separate two slides decreases. Take two sets of glass slides, each with a different image. The standard measurements were taken. One of the slides was covered with the formulation. The other presentation slide was placed on top of the gel, causing the gel to be crushed in the process. In a region occupied by a distance of 6 cm along the slide between the two slides. A 100gm weight was placed on the upper slide to uniformly press the gel between the two slides into a thin layer. The extra gel adhering to the slides was scraped off and the weight was removed. The two slides in place were secured in such a way that only the upper slide could fall off freely due to the force of the weight linked to it. The upper slide was weighted with a 20gm weight. The amount of time it took the upper slide to traverse 6 cm. Under the influence of, the upper slide parted from the lower slide. The weight was taken into account. It was decided to repeat the experiment. The experiment was repeated 3 times both formulated gels & marketed gel & the meantime taken for calculation.

Spreadability was calculated by using the following

**Formula,**

$$S=M \times L / T$$

Where,

S- Spreadability

M- Weight tied to the upper slide

L- Length of the glass

T- Time in sec<sup>4</sup>.

**6. Washability:**

Formulations were applied to the skin, and then the ease and extent of washing with water were personally assessed.

**7. Grittiness:-**

Microscopically the formulations were examined for the existence of any particulate matter or aggregate under 40x magnifications.

**8. Foamability:**

It is the ability of a formulation to create foam as a result of the addition of a surfactant.

**9. Irritability:**

Test to see how the formulation affects you. The formulation was applied to the dorsal surface of the left hand in a 1 sq cm region of skin and examined over a 1- 2 hour period.

**10. Extrudability:**

The ability of a material to be extruded via the nozzle is known as extrude ability<sup>7</sup>.

**RESULTS AND DISCUSSION:**

**1. Physical parameters:**

Color, Odor, texture and formulation state are all physical parameters. As seen in table 1,



**Table 1: Physical parameters of formulation**

Sr. no.	Parameter	Fnh1	Fnh2	Fnh3
1	Color	Orange brown	Orange brown	Orange brown
2	Odor	Fresh menthol	pleasant	pleasant
3	Texture	Smooth ,slippery	Smooth ,slippery	Smooth ,slippery
4	State	gel	semisolid	semisolid

**2. pH:**

Using pH paper, the pH of the formulation was found to be between 5.5 and 6.0. As shown in table 2.

**Table 2: pH of formulation**

Sr. no.	Formulation	pH
1	Market	5.8
2	Fnh1	5.6
3	Fnh2	5.5
4	Fnh3	6.0

**3. Consistency:**

The produced formulations have a semisolid cohesion. Visual observation corroborated this. Table no. 3 shows the results.

**Table 3: Consistency of formulation**

Sr. no.	Formulation	Washability
1	market	Semisolid
2	Fnh1	Semisolid
3	Fnh2	semisolid
4	Fnh3	semisolid

#### 4. Viscosity

The viscosity of the gel was measured using a Brookfield viscometer. The formulas' viscosity is in the region of- Table No. 4 shows the results.

**Table 4: Viscosity of formulation**

Sr. no.	Formulation	Viscosity
1	market	6.231
2	Fnh1	5.143
3	Fnh2	5.958
4	Fnh3	7.894

#### 5. Spread ability:

Spreadability investigations revealed that all formulations have greater spreadability than marketed formulations, ranging from 2.19 to 3.76, as shown in table no.5.

**Table 5: Spread ability of formulation**

Sr. no.	Formulation	Spread ability
1	market	2.18
2	Fnh1	2.89
3	Fnh2	2.16
4	Fnh3	3.76

## 6. Water washability:

The prepared formulations were easily washed. Table no. 6 shows the results.

**Table 6: Washability of formulation**

Sr. no.	Formulation	Washability
1	market	good
2	Fnh1	good
3	Fnh2	good
4	Fnh3	good

## 7. Grittiness:

Microscopically, the formulations were examined at 40 x magnifications for the presence of any particle matter or aggregate. They also serve as a scrub.

## 8. Foam ability:

All formulations were found to produce consistent foam.

## 9. Irritability:

During irritancy studies, a small amount of the gel was put to the skin and left for a few minutes. There was no redness, edema, inflammation, or irritation. This formula is risk-free to use on the skin.

## 10. Extrudability:

The formulations exhibit excellent extrudability. Shown no. Table no. 7.

**Table No.7 Extrudability of formulation**

Sr. No	Formulation	Extrudability
1	Market	Good
2	Fnh1	Good
3	Fnh2	Good
4	Fnh3	Good

Above all, the outcomes of the Fnh2 formulation are identical to those of the market formulation.



**Fig.1: Formulated face wash**



**Fig.2: Evaporation**



**Fig.3: Prepared formulations**

## CONCLUSION:

Natural remedies, like any other drug, are preferred above synthetic ones. According to a survey of natural skin care products, consumers choose Ayurvedic herbal or semi-synthetic facewashes and other skin care products. Herbal facewash is suitable for all skin types. Herbal face wash contains important nutrients that nourish the skin completely and help it stay healthy. The goal of this study is to develop a semi-synthetic facewash that may be used on a daily basis by people of all ages. It aids in the maintenance and nourishment of skin both outwardly and inside.

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