

# FORMULATION AND EVALUATION OF HERBAL SOAP



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**ABSTRACT:**

**Plant-based materials, botanical herbs, and essential oils are used to make herbal soap, a natural washing solution. It is mild on the skin and environmentally beneficial because it doesn't include harsh chemicals, artificial perfumes, or artificial colors like traditional soaps do. The natural ingredients in herbal soap have antibacterial, antifungal, anti-inflammatory, and antispasmodic qualities that help treat a variety of skin disorders, including psoriasis, eczema, and acne. Herbs including lavender, chamomile, peppermint, rosemary, lemongrass, tea tree, calendula, oatmeal, aloe vera, clove, neem, turmeric, sage, and comfrey are frequently included in herbal soap. Every herb offers unique health and skin advantages. Herbal soap is gaining popularity as a safe and environmentally friendly alternative to chemical-based personal care products as consumers' concerns about these products grow. The study's goal and objective are to evaluate the presence of phytochemicals in the extract and to create a herbal soap utilizing *Ocimum Basilicum* and *Hartal varki* extracts. Both extracts were combined with soap base, sodium lauryl sulphate, coconut oil, glycerine, and rose oil, and the resulting soap was standardized for colour, odour, texture, foam test, moisture content, total alkali content, and $_{P}$H.**

**KEYWORDS: HERBALSOAP, *OCIMUM BASILICUM*, HARTALWARKI, ANTIBACTERIAL**

## INTRODUCTION:




Figure no:1 Herbal soap

## HERBAL SOAP:

Herbal soap is manufactured from natural materials such as herbs and plants. Herbs including lavender, mint, rosemary, and chamomile are widely used in herbal soaps. These herbs contain essential oils, vitamins, and minerals that have therapeutic benefits for skin. Herbal soap is popular among those with sensitive or dry skin due to its soothing, renewing, and healing effects.

There are currently many substandard beauty preparations on the market and a large number of contaminated cosmetic items, which could result in adverse effects like skin rashes, allergic responses, or even the emergence of skin illnesses.[1]

The main ingredients of herbal soaps are plant parts such seeds, rhizomes, and roots. Its properties include antiseptic, antioxidant, antibacterial, and anti-aging. Unlike

commercial soap, herbal soap does not contain any artificial dyes, flavors, fluorides, or other additions.[2]

According to the technique of manufacture, natural soap can be broadly classified as melt-pour, hot process, or cold process. Transparent or translucent soap is the term for the hot process soap. The melt and pour (M&P) soap making process uses pre-made soap bases to simplify the process of creating soap. Melting a commercially prepared soap base, adding additions, and putting it into molds are all part of the process.The soap offers a long-lasting scent, good moisturizing properties, reduced irritation, and good cleaning or detergency power. Various dried herbs, flowers, and stems are added to a soap base to create herbal soaps. Because of their great therapeutic worth, affordability, accessibility, and compatibility, herbs are natural products that can be used to treat nearly all illnesses and skin conditions. [3,4]

**TYPES OF HERBAL SOAP:**

Skin washing products are widely classified into five groups based on their form, function, and application

- Body soap
- Toilet soap
- Face wash
- Cleansing cream
- Cleansing milk

- Understanding your skin type is essential for getting the most out of your skincare routine. There are various varieties of skin, thus you should care for your skin properly. The most effective strategy to treat your skin is to understand your skin type and what nutrients your skin need, and then act appropriately
- Based on its texture, skin can be classified into many categories. The various kinds of skin are...

- Normal skin
- Oily skin
- Dry skin
- Combinations [5]

**Normal Skin Type**

Normal skin is balanced—not too dry or too oily—and usually has these features:

- Few or no blemishes
- Slight sensitivity
- Small, barely visible pores
- A healthy, glowing look.

**Oily Skin Type**

Oily skin usually has:

- Big pores
- A shiny or sometimes dull, thick appearance
- Blackheads, pimples, or other spots

**Dry Skin**

Dry skin can cause:

- Almost invisible pores
- Dull, rough complexion
- Red patches, less elasticity, and visible lines

It may crack, peel, itch, or become inflamed. Causes include genetics, aging, weather, UV radiation, heating, hot baths, and harsh products or medications.

**Combination Skin Type**

Combination skin has both dry or normal areas and oily zones, typically around the T-zone (forehead, nose, chin). It often shows larger pores, blackheads, and a shiny appearance in certain areas. This type of skin requires a tailored skincare routine, focusing on balancing oil in oily zones while hydrating dry areas. Regular exfoliation and moisturizing are key.



**Figure no 1.1 Normal skin**



**Figure no 1.2 oily skin**



**Figure no 1.3 dry skin**



**Figure no 1.4 combination skin**

**PLANT PROFILE:** [6]

**1) Basil (Thiruneetru pachilai):**



Figure no: 2 Basil

**Biological name :** *Ocimum basilicum*
**Family :** *Lamiaceae*
**Chemical composition:**

Table no: 1composition

| *S.no* | *Component* | *Composition %* |
|---|---|---|
| ***1*** | *α-Pinene* | *0.7* |
| ***2*** | *Camphene* | *1* |
| ***3*** | *β-Pinene* | *1.5* |
| ***4*** | *β-Myrcene* | *1.2* |
| ***5*** | *1, 8- Cineol* | *12.2* |
| ***6*** | *β-Ocimene* | *2.1* |
| ***7*** | *γ-Terpin* | *1.3* |
| ***8*** | *Linalool* | *48.4* |
| ***9*** | *Camphor* | *0.8* |
| ***10*** | *Myrtenol* | *1.5* |
| ***11*** | *α-Cubebene* | *5.7* |
| ***12*** | *Eugenol* | *6.6* |
| ***13*** | *Methyl cinnamate* | *6.3* |
| ***14*** | *Caryophyllene* | *2.5* |
| ***15*** | *Azulene* | *1.6* |
| ***16*** | *α-Farnesene* | *2* |
| ***17*** | *Germacrene B* | *1.9* |
| ***18*** | *Germacrene D* | *0.9* |
| ***19*** | *Naphthalene* | *0.5* |
| | *Total %* | *96.7* |

**Uses :**

- O. basilicum is rich in phytochemical components such as alkaloids, tannins, flavonoids, and saponins, which have anti-inflammatory, antioxidant, antiviral, and antibacterial properties.[7]
- The seeds and roots were used to cure fever, hemorrhage, respiratory conditions, and bleeding piles.
- Sweet basil's leaves and flower petals are used to cure skin conditions, snake bites, and bug stings.[8]

**2)Hartal warki:**



Figure no:3 Hartal Warki

**Other names:** Ponnatharam, Haratal stone hartal varki , yellow arsenic sulphide
**Uses:**

- Hartal Warki is a rare mineral that has been used in traditional medicine for centuries. Its applications include hair removal and skin care**.**
- It is a gentle and effective solution without harsh chemicals.

**3) coconut oil:**



Figure no :4 coconut oil

**Botanical name**: Cocus nucifera
**Kingdom:** Plantae
**Order:** Commelinids
**Family:** Arecaceae
**Genus:** Cocus L
**Species:** C. nucifera
**Parts used:** oil
**Uses:** Reduces stretch marks, relieves sunburn, and treats skin disorders like psoriasis and eczema.[9]

**4)Rose oil:**




Figure no:5 rose oil

**Botanical name**: rosa

**Plant typically used:** Leaves
**Benefits of using rose oil in soap:** the antibacterial, antifungal, and antiviral qualities of rose essential oil make it perfect for treating a variety of skin disorders. Rose water maintains the pH balance of the skin and purifies it.[5]

**5)SLS:**



Figure no:6 sodium lauryl sulfate

**IUPAC name:** Sodium dodecyl sulfat**e**
**Other names :** Sodium monododecyl sulfate; Sodium lauryl sulfate; Sodium monolauryl sulfate; Sodium dodecanesulfate; dodecyl alcohol, hydrogen sulfate, sodium salt; n-dodecyl sulfate sodium; Sulfuric acid monododecyl ester sodium salts.

Table no: 2 characteristics of SLS

| | |
|---|---|
| **Chemical formula** | $C_{12}H_{25}NaSO_4$ |
| **Molar mass** | 288.372 g/mol |
| **Appearance** | white or cream-colored solid |
| **Odour** | Odourless |
| **Density** | 1.01 g/cm$^3$ |
| **Melting point** | 206 °C (403 °F; 479 K) |

**Uses:** surfactant
**Other chemical:** glycerine

**MATERIALS AND METHODS:**

DESCRIPTION OF MATERIALS: Every ingredient used in this recipe is of herbal quality. The ingridients come from a variety of sources. Ocimum basilicum was collected from a home garden. Hartal warki, coconut oil, rose oil and soap base were purchased from the local market.

**METHOD**: Melt pour method.

**Maceration technique:** Maceration extraction is a simple method where plant material is soaked in a solvent for an extended period, usually at room temperature, to extract desired compounds**.** Two days ago, Hartal Warki soaked in distilled water and utilized the extracts for soap preparation.

**FORMULATION OF HERBAL SOAP:**
Ingredients, Quantity and Its Activity

**Table no: 3 Formulation**

| s. no | Ingredients | Quantity Trial 1 | Quantity Trail 2 | Activity |
|---|---|---|---|---|
| **1** | *Ocimum basilicum* | 11g | 10g | Antibacterial , anti-inflammatory property |
| **2** | *Hartal warki* | 9g | - | Used to remove unwanted hair from the face and body |
| **3** | Coconut oil | 1.5ml | 3ml | Moisturizer |
| **4** | Glycerine soap base | 75g | 65gm | Soap base |
| **5** | Rose oil | 1.5ml | 2.5ml | antibacterial |
| **6** | SLS | 2g | 3g | surfactant |

**Procedure:**
**Trial 1:**
1.Fill a beaker with 75 grams of soap base.
2. Using a water bath, adjust and maintain the temperature to heat the soap base.
3. A soap base will transform into a liquid after heating.
4.Next, add the materials listed in the formulation table
5. Use a water bath to bring the mixture to a boil.
6. Without stirring, get the right combination.
7. A soap mold is filled with this mixture.
8. Let it cool at room temperature for two to three hours.
9.soap is produced.

**Trail 2: Same as trial no 1 but hartal warki is not used as API and quantity are mentioned above the list**

**EVALUATION OF HERBAL SOAP:**
In order to compare the created formulation's quality to that of commercialized herbal soap, the following physico-chemical parameters were evaluated.

**Physical parameter:**
On a white background, the prepared soap's color and clarity were visible to the unaided eye. The soap's order was detected by its scent.

**pH:**
10% soap solution was made by dissolving 10 grams of soap in 100 ml of distilled water in a volumetric flask. Using a pH meter, the pH was determined. When an electrode was added to the solution, the pH was recorded.

**Foam formation:**
The ability of the herbal soap to create foam was assessed by dissolving 1.0 g of soap in 50 ml of distilled water in a 100 ml graduated measuring cylinder. After shaking the measuring cylinder for two to three minutes, it was let to stand for ten minutes. After ten minutes, the foam height was measured. Three successive experiments' worth of observations were recorded, and the mean was calculated[5].

**Foam retention time:**
It is the amount of time the foam formed by the soap remains. The method mentioned above was repeated, and the foam interval was measured for around 5-10 minutes [5].

**% free Alkali content:**
150 ml of distilled water was then added to the beaker that had 10g of dry soap. On a water bath, the soap was heated at reflux for 30 to 40 minutes in order to dissolve it. Distilled water was added to the 250 ml conical flask once this solution had cooled and been moved there with the washings. Ten millilitre of the soap solution were placed in the titration flask, and two drops of the phenolphthalein indicator were added. The solution was then titrated until it lost its colour against 0.1M HCl.[11]

**Alcohol insoluble matter:**
A conical flask containing a 5 g sample of soap was filled with 50 ml of warm ethanol to dissolve it. After filtering the liquid using tarred filter paper and 20 millilitre of heated ethanol, it was dried for an hour at 1050 C. The paper used for the weighted filter was dry.[11]

**TFM (total fatty matter) determination:** The process for analyzing the total fatty matter in the soap sample involves the soap reacting with an acid in conjunction with hot water. About 10g of the soap sample was obtained for this method, and it was dissolved in 150g of distilled water. Heat was used to disintegrate it. After that, 20% sulfuric acid was added to this soap solution, and it was heated until it cleared. The film's surface would show fatty acids, which were subsequently solidified by adding seven grams of beeswax and heating it once again[5]. When a cake forms, it is taken out and weighed.
% Total Fatty Matter = (A –X)/W x 100
where, X= weight of wax
A= weight of wax+ oil
W= weight of soap

**RESULTS AND DISCUSSION:**

The results for the biological and physico-chemical analyses are given in the tables below.

**Maceration method:**



**Figure no:7 Hartalwarki**




**Figure no:8 Maceration of Hartalwarki**

**Table no :4**

PHYSICO-CHEMICAL PARAMETERS OF FORMULATION

| PARAMETERS | **Prepared herbal soap (Trail-1)** | **Prepared herbal soap (Trial-2)** | **Marketed herbal soap** |
|---|---|---|---|
| PHYSICAL PARAMETERS (COLOR, CLARITY AND ODOUR) | Colour: green<br>Odour: Pleasant<br>Clarity: Crystal clear | Colour: Green<br>Odour: Pleasant<br>Clarity: Turbid | Colour: Green<br>Odour: Pleasant<br>Clarity: Turbid |
| PH | 7.9 | 6.2 | 7.8 |
| % FREE ALKALI CONTENT | 0.20 | 0.33 | 0.25 |
| FOAMABILITY | 6 cm | 2cm | 5.2 cm |
| FOAM STABILITY | 5.5 cm | 1cm | 4.5 cm |
| TFM | 70% | 60% | 73% |
| ALCOHOL INSOLUBLE MATTER | 16.99 | 17.90 | 17.60 |
| IRRITATION | Non irritant | Irritant | Non irritant |

**TRIAL 1:** It contain *Ocimum Basilicum* and Hartalwarki

**TRIAL 2:** It contain only *Ocimum Basilicum*



**Figure no:9 Trial 1**



**Figure no:10 Trial 2**




**Figure no:11 Marketed Herbal Soap**

**Conclusion:**

TRIAL 1 is best when compared with TRIAL 2 because the manufactured soap was evaluated in terms of its physicochemical and biological properties. The formulation looked great and had a pleasant colour and fragrance. The pH was found to be within the specified range of 7 to 10. The percentage of free alkali content, moisture content, foamability, foam stability, and alcohol insoluble matter were among the other parameters assessed to determine the standard values for soap. The physicochemical parameters of the intended soap were good and equivalent to the control, demonstrating the potential benefits of the plant material's aqueous extracts in soap production. We utilized this label for our own purposes not for marketing. This name is obtained from ***Ocimum basilicum -MUM and hartalwarki - TAL***




**Figure no:12 mumtal herbal soap**

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