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FORMULATION AND STANDARDIZATION OF POLY HERBAL SOAP

Bavinasri R.*, Dhanusri K., Initha J. N., Keerthana S. and Malathi M.

*Bachelor of Pharmacy, Srinivasan College of Pharmaceutical Sciences, Samayapuram, Trichy-621111.
Suganthi R. Assistant Professor, Srinivasan College of Pharmaceutical Sciences, Samayapuram, Trichy-621111.

***Corresponding Author Bavinasri R.**
Bachelor of Pharmacy, Srinivasan College of Pharmaceutical Sciences, Samayapuram, Trichy-621111.

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1. ABSTRACT

The synergistic activity of neem (*Azadirachta indica*), hibiscus (*Hibiscus rosa-sinensis*), and great basil (*Ocimum basilicum*) are combined in this polyherbal soap composition to create a safe and efficient skin care solution. With its antibacterial, antifungal, anti-inflammatory, and antioxidant qualities, this herbal blend is appropriate for a range of skin types. By utilizing the advantages of natural ingredients, this polyherbal soap composition provides a comprehensive approach to skin care and encourages healthy, radiant skin. The natural components in the soap aid in.

- Soothe and calm the skin
- Reduce acne and inflammation
- Provide gentle cleansing and moisturizing
- Promote overall skin health and radiance

KEY INGREDIENTS: Great Basil, NEEM, HIBISCUS.

2. INTRODUCTION

Plants with one or more components (such as leaves, roots, bark, seeds, flowers, and stems) that contain substances used to heal illnesses are known as medicinal plants. These plants offer several benefits, including being safe and natural, being affordable, being readily available, and having cultural importance. Herbal soap is also made from a few medicinal plants. Herbal soap is a form of soap that uses botanicals, herbs, and other natural components to provide a skin-cleaning and nourishing product. These are kind to the skin and don't cause irritation. Because of their anti-inflammatory, antibacterial, and antioxidant qualities, the herbs utilized in the mixture are carefully chosen.

The use of artificial chemicals in cosmetics and beauty products is declining among consumers. For instance, natural soap uses functional components derived from natural materials, including essential oils or plant extracts, rather than artificial surfactants. These organic ingredients are prized for their natural scents and skin-benefitting properties. While plant extracts like chamomile and aloe vera have calming and hydrating qualities, essential oils like lavender and tea tree have therapeutic effects. These components help natural soaps stay away from harsh chemicals like sulphates and parabens, which can irritate skin and damage the environment. This change is a part of a broader clean beauty movement, in which customers value sustainability, ethics, and transparency in the products they select.

2.1. SKIN

The largest organ in the body, the skin controls body temperature, aids in sensory processes, and acts as a barrier against external dangers. It is extremely vulnerable to environmental elements including pollution, harsh chemicals, and UV radiation, which can cause skin irritation, dryness, and other problems. In order to preserve the health of their skin, consumers are increasingly using kinder substitutes, such herbal soaps. Natural plant-based components are used to make herbal soaps, which are renowned for their skin-benefitting qualities.

2.2. TYPES OF SKIN

There are various kinds of skin, and they are typically divided into groups according to traits like oil production, sensitivity, and moisture content. These are the primary skin kinds.

i. Normal skin
ii. Oily skin
iii. Dry skin
iv. Combination or Sensitive skin

2.3. TYPES OF SKIN DISEASES

Skin diseases can be caused by a variety of factors including infections, allergies, genetic conditions, environmental factors, and lifestyle choices.

Contact Dermatitis

This is the most typical response. When soap depletes the skin's natural oils, it causes dryness, irritation, redness, and occasionally even peeling or splitting.

Fig.no. 1: ContactDermatitis.

Allergic Dermatitis

This happens when an element in the soap, including aroma, preservatives, or certain compounds, triggers an immunological response. Redness, swelling, itching, and occasionally blisters might result from it.

Fig. no 2: Allergic Dermatitis.

Psoriasis Flare-ups

Despite not being the main cause, regular washing or strong soaps can make pre-existing psoriasis worse. More severe symptoms like itching and scaly, red patches could result from this.

Fig.no. 3: Psoriasis Flare-ups.

Acne

The use of harsh soaps or those containing irritating substances that might clog pores or cause skin irritation is usually the cause of soap indused acne.

Fig.no. 4 Acne.

Dry Skin (Xerosis)

Excessively dry skin can result from frequent soap use, particularly if the soap is overly harsh or drying. Rough patches, peeling, and tightness are possible symptoms of this illness.

Fig.no:5. Dry skin (Xerosis)

3. MATERIALS AND METHODS

3.1. COLLECTION OF HERBALS

The plant materials ware collected from natural source and local market of Trichy. Fresh leaves of *Azadirachta indica, Hibiscus rosa-sinensis linn, Ocimum basilicum linn* is used for this preparation.

- Identification: The herb's precise botanical identification.
- Selection: Pick plants that are disease-free and healthy.
- Harvesting Equipment: Make use of sterile, clean knives or scissors.
- Conditions for collection: dry weather with no precipitation or plant moisture.
- Processing Right Away: To stop deterioration, start washing, chopping, or grinding as soon as possible after harvest.

3.2. MATERIALS

Table no: 1. Materials used for soap.

INGREDIENTS	MORPHOLOGY	USES
 **Fig.no:6. NEEM**	**BIOLOGICAL SOURCES:** *Azadirachta indica* **FAMILY:** *Meliaceae* **CHEMICAL CONSTITUENTS:** Azadirachtin Quercetin Nimbin Flavonoids Tannins	Anti-microbial Anti-inflammatory Anti-ulcer Anticancer Anti-malarial
 **Fig.no:7. HIBISCUS**	**BIOLOGICAL SOURCES:** *Hibiscus rosa sinensis linn* **FAMILY:** *Malvaceae* **CHEMICAL CONSTITUENTS:** Flavonoids Phenolic acids Fatty acids Triterpinoids Mucilage	Diuretic Laxative Fibers production Perfume Foaming agent
 **Fig.no:8. GREAT BASIL**	**BIOLOGICAL SOURCES:** *Ocimum basilicum linn* **FAMILY:** *Lamiaceae* **CHEMICAL CONSTITUENTS:** Flavonoids Phenolic compounds Tannins Linalool Triterpene	Cancer prevention Anti-inflammatory Anti-oxidant Flavouring agent Blood sugar regulation
 **Fig.no:9. GLYCERIN BASE**	**IUPAC NAME:** Propane-1,2,3-triol **MOLECULAR FORMULA:** $C_3H_8O_3$ **BOILING POINT:** 290^0C **MELTING POINT:** 17.8^0C	Moisturizer Facial cleansers Hydrating power Rich humectant Heal stretch mark

 **Fig.no:10. ROSE OIL**	**BIOLOGICAL SOURCES:** *Rosa centifolia* **FAMILY**: *Rosaceae* **CHEMICAL CONSTITUENTS:** Citronellol Nerol Geraniol Phenyl ethyl alcohol	Anti-aging Antibacterial Aromatherapy Anti-inflammatory Flavouring agent
 **Fig.no:11 COCONUT OIL**	**BIOLOGICAL SOURCES:** *Cocos nucifera* **FAMILY:** *Arecaceae* **CHEMICAL CONSTITUENTS:** Linoleic acid Oleic acid Catechin Poly phenols Phytosterol	Moisturizer Versatile base Makeup remover Wound healing Acne treatment

3.3 EXTRACTION

Fresh grinding extract refers to the **mechanical process of grinding freshly harvested herbal plant parts** (like leaves, stems, flowers, or roots) to extract natural juices, essential oils, and active phytochemicals. It is done **without drying or heat** to retain the full spectrum of bioactive constituents.[1,2,3,4]

Process Steps[1,2,3,4]

1. **Collection**: Fresh herbs are collected and cleaned.
2. **Washing**: Removes dirt, microbes, and surface impurities.
3. **Grinding**: Herbs are ground using mechanical blenders, stone grinders, or mortar and pestle.
4. **Filtration (optional)**: Solid particles are filtered using muslin cloth or sieves.
5. **Usage**: The extract is used immediately in formulations (like cosmetics, soaps, or pharmaceuticals).

4. FORMULATION OF POLY HERBAL SOAP

- The glycerin base is melted on a hot plate.
- Freshly collected plant extracts are mixed with melted base material.
- These materials are heated for 10 mins.
- Then coconut oil and rose oil were added.
- The mixture materials are transferred into a soap mold.
- After 24 hours, the soap was kept from the mold.

Table no. 2: Ingreidents of soap.

Ingredients	Trial no: 1	Trial no:2	Activity
NEEM	8.1ml	10ml	Anti microbial
GREAT BASIL	8.2ml	10ml	Anti aging
HIBISCUS	8.5ml	10ml	Brightening
GLYCERIN BASE	36.25gm	30gm	Emollient
ROSE OIL	1ml	0.5ml	Flavouring agent
COCONUT OIL	3ml	1ml	Moisturing agent

5. EVALUATION OF HERBAL SOAP

Herbal soap evaluation typically involves assessing various parameters to ensure quality and effectiveness.

Determination of Organoleptic Characteristics

Clarity and colour was checked by naked eyes against the white background, and the odour was smelled.[5]

Thickness determination

The thickness was determined with the help of a screw gauge which is pre-calibrated. The thickness was measured, by observing the thickness at five different parts of the soap.[6]

Weight determination.

The weight was determined by using a Digital weighing balance.[7]

Foam height

A sample of soap weighing 0.5 grams was obtained and dissolved in 25 milliliters of distilled water. After that, put it into a 100 ml measuring cylinder and added water to get the volume up to 50 ml. After giving 25 strokes, the aqueous volume was measured up to 50 ml, and the foam height was measured above the aqueous volume.[8]

Foam retention

After making 25 milliliters of the 1% soap solution and pouring it into a 100 milliliter measuring cylinder, shake it ten times. For four to five minutes, the volume of foam was measured every minute.[9]

Moisture content

A little over 5g of the sample under investigation were precisely weighed, moved to a known-weight tarred porcelain dish, and then heated to 105°C for 2 hours in a hot air oven. In order to determine the true weight of the tarred china dish, the sample and the dish were weighed together. To determine the % moisture content6, the content's weight was recorded.[10]

pH

The pH test was performed for all the formulations. Each formulation of soap solution was dissolved in 20ml of distilled water and tested for pH with the help of a digital pH meter. The measurement of pH of all the formulations was done in the previously calibrated pH meter.[11]

Total fatty matter

By reacting soap with acid in the presence of hot water and measuring the resulting fatty acid, TFM was determined. After dissolving 10g of the designed soap in 150ml of distilled water, the mixture was heated. 20 milliliters of 15% H2SO4 were added to this and heated until a clear solution was achieved. The resulting solution's surface fatty acid was solidified by heating it once again and adding 7g of beeswax. It was then permitted to cake. After removing the cake, it was blotted dry and weighed using formula.[12]

%TFM= (Weight of the cake- Weight of the wax) in gm/Weight of the soap in gm x 100

Alcohol insoluble matter

5gm of soap was taken in a conical flask and added 50ml warm ethanol and shaken vigorously to dissolve the soap. The solution was filtered through a tarred filter paper with 20ml of warm ethanol and dried at 105 ˚C for 1hr. The weight of the dried paper with residue was taken.[13]

Formula: % Alcohol insoluble matter = Wt. of residue x100/wt. of sample

Irritancy test

It is carried out by applying soap on the skin for 10 minutes. If no irritation then it is considered as non-irritant product.[14]

6. RESULT AND DISCUSSION

The following table lists the prepared polyherbal soap's physiochemical parameters.

6.1 EXTRACTION

Fig.no 12: Extraction of Hibiscus.

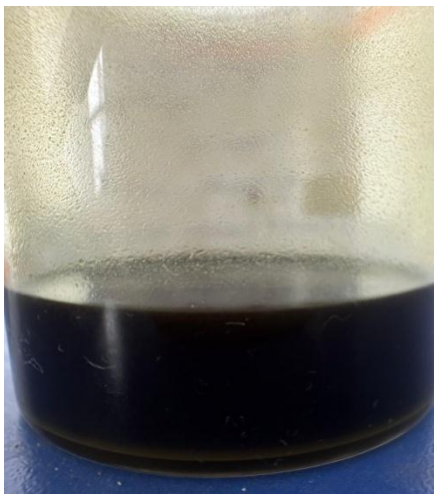

Fig.no 13: Extraction of Neem & Great Basil.

6.2 FORMULATION

Fig.no 14: TRIAL NO.

1 Fig.no 15: TRIAL NO 2.

PARAMETER	TRIAL 1	TRIAL 2	STANDARD VALUE
Colour **Odour** **Shape**	Green Aromatic Oval	Olive Green Herbal aroma Round	_
Thickness	2.6 cm	2.2 cm	2.0cm – 2.5cm
Weight	58 gm	50 gm	_
Foam height	98mm	132mm	100-150mm
Foam retention	3 mins	4.3 mins	3-5 mins
Moisture content	14%	11%	10% - 15%
pH	7.2	6.1	6-7
TFM	73%	76%	Above 70%
Alcohol insoluble matter	2.4%	1.6%	Less than 3.0%
Irritancy test	Not irritant	Not irritant	Not irritant

CONCLUSION

Herbal soap is significant because it is free of harsh chemicals and manufactured from natural elements like essential oils and plant extracts, which make it soft on the skin. In addition to its antibacterial and restorative qualities, it aids in skin cleansing, hydration, and nourishment.

Two trials successfully prepared and assessed the polyherbal soap made with hibiscus (*Hibiscus rosa-sinensis*), great basil (*Ocimum tenuiflorum*), and neem (*Azadirachta indica*). Analysis of both experiments was done using important physicochemical parameters.

TRIAL 1: Shown respectable foaming and cleaning qualities, but a somewhat lower TFM value and foam stability.

TRIAL 2: Which had better herbal extract blending and proportions, showed enhanced texture, higher TFM, higher foam height, and longer foam retention time, all of which indicated superior quality and skin-friendly qualities.

As a result, Trial 2 was determined to be more stable and effective than Trial 1, indicating that the optimal blend of neem, great basil, and hibiscus in Trial 2 provides improved herbal benefits, consumer acceptability, and cleansing efficiency. In future we are planning to conduct *in vitro* and *in vivo* studies on the herbal soap for scientific research, especially in the development and evaluation of medicines, cosmetics ,and herbal products.

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