

Formulation And Evaluation of Lemongrass Herbal Soap

Vaibhavi Ravi Gore

SANJAY GHODAWAT UNIVERSITY
KOLHAPUR 416118

Date of Submission: 14-08-2026

Date of Acceptance: 27-08-2026

ABSTRACT: -

Herbal products have been used since ancient times, with one of the first to classify plant into categories like trees, herbs, shrubs. In formulation, herbs are particularly esteemed for their medicinal and cosmetic application. Herbal soaps are from natural ingredients such as lemongrass, rosemary, mint, lavender and chamomile, which render them gentle and safe for skin. Lemongrass belong to the family of *poaceae*. It essential oils that are abundant in *citral*, *limonene*, and *citronellal* both fragrance and therapeutic benefits. Such herbal formulation protects from dryness, pigmentation, sun damage, wrinkles. This study focuses on the preparation of herbal soap as an effective natural cleanser. Factors such as Ph., foam ability, and skin compatibility are evaluated to guarantee stability, safety, quality.

Herbal soap is recognized for their gentle and skin friendly properties making them ideas for individual with sensitive skin type. They are formulated with natural antibacterial and antifungal components. Composed of plant derived ingredients these soaps are environmentally friendly and biodegradable. The including essential oils also offers aromatherapy advantages including relaxation, stress alleviation, and enhancement.

In summary, lemongrass herbal soap serves as an effective and safe alternative to synthetic soaps. Organoleptic parameter: such as colour, odour, appearance, Physio-chemical Parameter such as pH, Foam index, Foam Index, Foam Height, Total Fatty Matter, Solubility, Skin Irritancy Tests was performed.

I. INTRODUCTION

Theophrastus, a philosopher from Greece, categorized plant into three distinct groups; herbs, trees, and shrubs. Three types of herbs salad herbs, sweet herbs and pot herbs. By the seventeenth century, pot herbs began to be known as vegetables due to selective breeding that modified their size, shape and flavor, distancing them from their wild counterparts. They were no longer exclusively regarded as suitable for cooking post. Herbal soaps as products that purify and enhance the skin. Advantage

using herbal cosmetics lies in their purity, the body with nutrients and beneficial minerals, no any adverse effects. Prolonged exposure to heat during summer can lead to dehydration of the skin, resulting, in wrinkles, freckles, blemishes, pigmentation and sunburns. [1]

HERBAL SOAPS

Herbal soap is a form of soap crafted from natural and herbal ingredients sourced from various herbs, trees, shrubs and plants. Commonly herbs in the production of herbal soap like lemongrass, lavender, mint, rosemary and chamomile. Herbal soap is calming, revitalizing and healing attributes, making it a favored option for individuals with a sensitive or dry to normal skin. Which may lead to the potential side effects such as skin rashes, skin allergic reaction and the onset of skin diseases. [2]

Herbal soap formulation is the considered medicinal or pharmaceutical due to their inclusion of antibacterial activity and antifungal activity. [3] Lemongrass is the tall, fragrant plant that belong in the family, *POACEAE* and biological source is leaves and oil of *CYMBOPOGON* species. It grows in the tropical areas such as Srilanka, southeast Asia in India. The most commonly species include *cymbopogon flexuosus* and *cymbopogon citratus* (medicinal purpose) Lemongrass is essential oil that is contain limonene, citral and citronellal, contribute to distinctive aroma. It is extensively as a flavoring agent in various foods and beverages is also known for medicinal benefits. [4-6] The purpose of developing and accessing lemongrass herbal soap is to create a natural and efficient to the cleansing product that the possesses antimicrobial and refreshing characteristics. It aims to guarantee its quality, stability, and safety to the evaluation tests such as PH, foam, and skin compatibility. [1-6]

ADVANTAGES OF HERBAL SOAPS

1) Gentle on the skin: - Herbal soaps tend to be more gentle and less harsh on the skin compared to synthetic soaps making them the suitable for individuals with sensitive skin types.

- 2) Natural antibacterial properties: - Herbal ingredients, such as neem, lemongrass, tea tree oil, possess antibacterial properties that help the cleanse and protect the skin from infection.
- 3) Eco-friendly: - Herbal soaps are generally, biodegradable eco-friendly and environmentally friendly as they are the crafted from natural ingredients unlike their synthetic compound.
- 4) Benefits of aromatherapy: - By the incorporating essentials oils into the herbal soaps, users can be enjoy aromatherapy benefits such as stress relief, mood enhancer and relaxation
- 5) Organic solvent: - These soaps often contain natural ingredients that hydrate and nourish the skin, such as shea butter, olive oil, aloe Vera and coconut oil, almond oil.
- 6) Free from chemicals: - The lack of chemicals, synthetic fragrances and artificial colors is the herbal soap reduce the rashes if skin irritation and allergic reaction.

DISADVANTAGES OF HERBAL SOAPS: -

- 1) Skin irritation and allergies: - Derived from natural sources, herbal ingredient can be trigger allergic reaction or lead to the skin sensitivity. some herbal soaps an alkaline in nature, which may result in dryness, irritation and compromise the skin natural barriers.
- 2) Shorter shelf life: - In the absence of synthetic preservatives, herbal soaps are prone to the spoilage, may lose their effectiveness, can become rancid more quickly
- 3) Photosensitivity: - To certain essential oils are contained in these soaps may heighten skin sensitivity to the sunlight.
- 4) Storage sensitivity: - These soaps, tend to be softer and can be easily melt or become mushy if not stored in a dry, cool environment.
- 5) Reduced lather and cleaning power: - Herbal soaps typically generate less foam, which is some consumers equate with the diminished cleaning effectiveness. They might be less capable of eliminating heavy grease or grime when compared to synthetic detergents.
- 6) High cost and limited availability: - To their natural components and smaller scale manufacturing, these soaps are frequently more costly and less accessible in mainstream retail outlets.

DIFFERENT MOTHEDS OF PREPRATION OF SOAPS:

- 1) Cold process method
- 2) Hot process method
- 3) Melt and pour method

- 4) Rebatching method

- 5) Industrial method

Cold process:

- 1) Oil and fats are combined with Sodium hydroxide (NaOH) lye is form at ambient temperature.
- 2) The mixture is poured into molds and allowed to cure for a period of 2-4 weeks.
- 3) This method produces high-quality natural or herbal soaps.

Hot process:

- 1) This method is similarly to the cold process but involves heating to accelerate saponification.
- 2) Soap is ready in a shorter time frame. The resulting texture is thicker and a rustic appearance
- 3) Melt and pour: - A pre-made soap base is melted and additives such as color and fragrance are incorporated. The mixture is then poured into molds and allowed to cool.
- 4) This process is easy and quick with no handling of lye necessary.

TYPES OF SOAPS:

- 1) Laundry soap
- 2) Cleaning soap
- 3) Personal soap
- 4) Novelty soap
- 5) Perfumed Soap
- 6) Guest soap
- 7) Beauty Soap
- 8) Medicated soap
- 9) Glycerin soap
- 10) Transparent soap
- 11) Liquid soap

II. AIM AND OBJECTIVE: -

AIM: -Formulation and evaluation of herbal soap.

OBJECTIVE: -The objective of this work is the formulation and evaluation of herbal soap using lemongrass.

The main objective was to formulated herbal soap or mediated with antibacterial and antifungal. The formulate herbal soap having minimum side effects. The main purpose for the preparation of herbal soap is to use natural ingredients of herbal soap is to use natural ingredients of the synthetic chemicals.

Outcome: - The natural ingredient present in herbal soap possesses is: Antifungal & Antibacterial Properties that effectively address various skin condition such as acne, psoriasis and eczema.

III. METHODOLOGY: -

Content of soap-

- 1) Lemongrass: -

Botanical name: -*Cymbopogon*

Family: - *Poaceae*

Common name: -Lemongrass

Chemical constituents: -limonene, citral and

citronellal Part typically used: - leaves

Colour: - Green

Properties: - Antifungal

Sr. No	Ingredient	Roles
1	Lemongrass extract	Anti-bacterial and anti-fungal activity
2	Sodium hydroxide	Transforms fats and oils into the soap
3	Coconut oil	Moisturizing, rich lather, reducing inflammation
4	Glycerine	Act as a primary humectant
5	Sorbitol	Stabilizer, natural humectant and skin conditioning agent
6	Propylene glycol	Boosting skin, hydration while improving soap transparency and texture.
7	Vitamin E	Moisturizer and antioxidant
8	SLS	Surfactant, cleaning agent and foaming agent.
9	Stearic acid	Increase hardness, boost durability, creamy lather.
10	Sugar solution	Enhancing moisture, boosting lather.
11	Distilled water	Vehicle.

INGREDIENT AND ROLES: -

METHOD OF PREPARATION:

1) PREPARATION OF LYE SOLUTION: NaOH was measured or weighed. NaOH was gradually incorporated into distilled water in a beaker while stirring continuously. The solution was permitted to cool to approximately 50-60°C.

2) PREPARATION OF OIL PHASE: -In a different beaker, coconut oil and stearic acid were measured. They were gently heated in a water bath to around 60°C. Vitamin E was added as a moisturizer and antioxidant. And add sugar solution.

3) MIXING: -The cooled solution was gradually added to the warm oil phase while stirring continuously. The mixture was stirred until it achieved the "trace" stage. (a light pudding like consistency). Lemongrass extract was added and mixed continuously.

4) MOLDING: - The mixture was poured into a soap mould. It was covered and allowed to set for 24-48 hours to solidify. The soap was then cut and taken out of the mould. It was left to cure for 4-6 weeks in a dry, well-ventilated area. During the curing process, excess water evaporated and the pH level stabilized. Glycerol was added to safeguard the skin.

INGREDIENTS

Sr. no	Ingredient	F1 (25gm)	F2 (50gm)	F3 (1000gm)
1	Lemongrass extract	0.025	0.05	1
2	Sodium hydroxide	1.32	2.64	60
3	Coconut oil	3.07	6.14	140
4	glycerine	4.8	9.65	220
5	sorbitol	3.07	6.15	140
6	Propylene glycol	2.19	4.38	100
7	Vitamin E	0.025ml	0.05ml	1ml
8	SLS	1.75	3.5	80
9	Stearic acid	1.32	2.64	60
10	Sugar solution	q.s	q.s	q.s

11	Distilled water	6.75	13.15	300
----	-----------------	------	-------	-----

EVALUATION TEST: -

1) Organoleptic parameter: a) Colour: - green)
Odour: - aromatic c) Appearance: - smooth shine texture

2) Physico-chemical Parameter: -a) pH: - By combining 10 ml of distilled water with 2 gm of the finished soap and stirring, a dissolved sample is obtained. A pH meter was utilized to determine the pH level. The normal pH is appear to the 6-7
b) foam index: -The foaming index of soap is established by creating a 1% soap solution (1.0g of soap in 99 ml of water at 40°C) and then transferring a specific volume into a graduated cylinder. Then pour 30 ml of solution into a 100 ml graduated cylinder it is recorded as a (V0) Stopper it, shake it vigorously 10 times in 10 seconds use same force Each time. Measure foam immediately record total volume (V1) at 30 second, that's liquid & foam. After 5-minute record volume (V2) to check foam stability.

$$\text{Foaming index} = V1 - V0$$

Units: ML of foam from 30 ml of solution

$$\text{Formula: - Foam stability \%} = \frac{V2 - V0}{V1 - V0} \times 100$$

3) FOAM HEIGHT:

A 0.5 gm sample of herbal soap was collected and dissolved in a 25 ml of distilled water. it was then transferred into a measuring cylinder and additional distilled water was added to reach into a total volume of 50 ml. the aqueous volume was again measured to confirm it was 50 ml and the foam height was recorded. [8]

$$\text{Formula: - Foaming height} = \text{Total height} - \text{Liquid height}$$

4) TOTAL FATTY MATTER: -

combining soap with acid in hot water and measuring the resulting fatty acid TFM calculated [9]

By

$$\%TFM = \frac{(\text{weight of the cake} - \text{weight of wax})}{\text{weight of soap in gram}} \times 100$$

5) SOLUBILITY: -

gm of soap added into 10 ml of solvent and shake it for 3-5 min and then view the solubility results.

1.5

6) SKIN IRRITANCY TEST:

An area of 2-3 sq. centimetre was marked on the dorsal surface of the right hand. The herbal soap was applied to the right side within the designated area and observed the made regarding the condition of the hand. Irritancy erythema and edema were assessed at regular intervals for up to 24 hours and reported

An

IV. RESULT

Sr. no	Test	Formulated Soap	Marketed Soap
1	PH	7.2	6 to 8
2	Odour	Aromatic	Aromatic
3	Colour	Brownish Green	Green
4	Solubility Test	Soluble in Water	Soluble in Water
5	Stability Test	Present	Present
6	Foaming Index	8.3	1.3 to 22
7	Foaming Height	13	5.2 to 15cm
8	% TFM	68%	60 - 70% or More

V. CONCLUSION

Lemongrass herbal soap is a natural and effective cleaning formulation that merges the antimicrobial,

antifungal and refreshing qualities of lemongrass with the gentle cleaning action of herbal components.

It effectively eliminates dirt and excess oil from the skin also delivering a calming aromatic experience that encourages skin rejuvenation and relaxation

The inclusion of natural ingredients renders it appropriate for regular use with the minimal side effects for those with sensitive skin

In summary lemongrass herbal soap serves as an eco-friendly, skin friendly alternative to synthetic soaps, providing the both therapeutic and cosmetic advantages.

[8]. Kumar k. sudheer, et.al.formulation and evaluation the herbal bath soap using extracts of plant having ethnic and dermatological importance in Ayurveda, neuroquantology.2022;20(12);1055.

[9]. www.google.com.

REFERENCES: -

- [1]. Sindhu, rakesh k, et al. formulation development and antimicrobial evaluation of polyhedral soap. Plant archives2019;19(2):1342-1346.
- [2]. Arun sk.”formulation and evaluation of herbal soap “World journal of pharmaceutical research 12.9(2023)2136-2147.
- [3]. Encyclopaedia Britannica,14th end;1929.
- [4]. F.Manzoor, n.naz, s.a.malik, s. Arshad,b.siddiqui.(2013).chemical composition of essential oils derived from eucalyptus and lemongrass and their antitermitic activities against microtermes mycophagus (desneux).asian journal of chemistry 25(5):2405.
- [5]. n.g.Tzortzakis c.d economakis (2007). Antifungal activity of lemongrass (cymopogon citratus 1) essential oil against key postharvest pathogens. Innovative food science and emerging technologies 8(2):253-258.
- [6]. b.t. schaneberg, i.a. khan.(2002). Comparison of extraction methods for marker compounds in the essential oil of lemongrass by gc. Journal of agricultural and food chemistry.50(6):1345-1349.
- [7]. Devi, seetha a, et.at. formulation and evaluation of antimicrobial herbal soap. Int. J pharm.sci. rev. res. 2021;71(2):122-125.