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## Formulation And Evaluation Of Herbal Soap From Laurus Nobilis

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### ABSTRACT

Herbal soap is a natural soap that is often made using herbs and plant-based ingredients. The use of herbal soap provides various benefits, such as healing the skin, natural fragrance, and smoothing; it is made using natural ingredients that do not harm the environment and is biodegradable. Herbal soaps, formulated with plant-based extracts and essential oils, have gained significant attention due to their natural, eco-friendly, and therapeutic properties.

This study aims to review the formulation, benefits, and effectiveness of herbal soaps in comparison to conventional synthetic soaps.

The atmosphere may cause chemical infection and damage to the skin, cosmetics alone are not sufficient to take care of the skin.

Herbal soap is made using natural ingredients, primarily plant-based extracts, essential oils, and natural colorants, which offer therapeutic and skin-nourishing benefits.

Herbal soap ingredients use tulsi, turmeric, bay leaf and turmeric shows anti-inflammatory and anti-bacterial properties and tulsi shows anti-viral.

**KEY WORDS:-TULASI, HERBAL,SOAP,Bacterial.**

## INTRODUCTION

### SOAP

Soap is a salt of a fatty acid (sometimes other carboxylic acids) used for cleaning and lubricating products as well as other applications. In a domestic setting, soaps, specifically "toilet soaps", are surfactants usually used for washing, bathing, and other types of housekeeping. In industrial settings, soaps are used as thickeners, components of some lubricants, emulsifiers, and catalysts.

Soap is a cleaning agent made from natural fats or oils combined with an alkali, usually sodium hydroxide (for bar soap) or potassium hydroxide (for liquid soap). When these ingredients react in a process called saponification, they form soap and glycerin.

### HOW THE SOAP WORKS

Soap works by breaking down grease and oils on the skin or surfaces, allowing them to mix with water and be rinsed away. It has two sides:

- ☐ One that is attracted to water (hydrophilic)
- ☐ One that is attracted to oils and grease (hydrophobic)

This dual nature helps soap lift dirt and germs off surfaces, making it an essential tool for hygiene and cleaning.

### HISTORY OF SOAP

Ancient times: Soap-like materials were used in Babylon around 2800 BC.

Roman era: Soap was used mainly for washing clothes rather than personal hygiene.

Middle Ages: Soap was produced in Europe using animal fats and plant ash.

Modern era: In the 19th and 20th centuries, soap became mass-produced and widely used for bathing and cleaning.

## TYPES OF SOAPS

Bar Soap – Solid form; often made with natural fats or oils.

Liquid Soap – Often contains synthetic detergents; convenient for handwashing.

Antibacterial Soap – Contains chemicals like triclosan; less recommended today due to bacterial resistance concerns.

Glycerin Soap – Transparent and moisturizing; good for sensitive skin.

Castile Soap – Made from vegetable oils like olive oil; very mild and eco-friendly.

Medicated Soap – Contains ingredients for treating skin conditions (e.g., acne, eczema).

## USES OF SOAP

- ☐ Personal hygiene (handwashing, bathing)
- ☐ Household cleaning (dishes, laundry)
- ☐ Industrial use (removing grease, sanitizing equipment)

## SOAP MAKING METHODS

There are four common methods:

- ☐ Cold Process
  - o Traditional method.
  - o Oils and lye are mixed at room temperature.
  - o Cures for 4–6 weeks.
  - o Preserves natural ingredients.
- ☐ Hot Process
  - o Similar to cold process but heat is applied.
  - o Speeds up saponification.
  - o Soap can be used sooner.
- o Melt and Pour
  - o Pre-made soap base is melted, customized, and poured into molds.
  - o Easiest method, often used in DIY kits.
- ☐ Commercial/Industrial Soap Making
  - o Involves continuous processes.

- o Soaps are refined, deodorized, and milled.
- o Often includes synthetic additives and preservatives.

### ENVIRONMENTAL IMPACT

- Natural soaps are biodegradable and generally eco-friendly.
- Synthetic detergents can pollute waterways.
- Palm oil (used in many soaps) is controversial due to deforestation—look for sustainably sourced options.

### SAFETY CONSIDERATIONS

- pH level: Soap is usually alkaline (pH 9-10). This can disrupt skin's natural barrier in some cases.
- Allergies/Sensitivities: Fragrances and preservatives can cause reactions.
- Infant/Delicate Skin: Use mild, unscented, or baby-specific soaps.

### SYNTHETIC SOAPS

**Ingredients:** Made with synthetic detergents, fragrances, and preservatives.

**Skin Benefits:** May offer a deeper cleanse but can be drying or irritating, especially for sensitive skin.

**Environmental Impact:** May contain persistent chemicals and may not be as biodegradable.

**Cost:** Generally cheaper due to the use of less expensive synthetic ingredients and simplified production processes.

### HERBAL SOAPS

Herbal soap is a natural, plant based alternative to commercial soaps, incorporating plant-based ingredients known for their medicinal and skincare benefits.

Herbal soap is a naturally designed to cleanse, nourish, and protect the skin using the therapeutic properties of herbs, essential oils, and botanical extracts. Unlike commercial soaps that may contain harsh chemicals, synthetic fragrances, and artificial preservatives, herbal soaps are crafted with ingredients derived from nature, making them suitable for all skin types, including sensitive and problem-prone skin.



**Fig.1. Herbal soap**

The formulation of herbal soap involves herbal additives, including aloe vera, turmeric, neem, and essential oils, enhance the soap's therapeutic properties.

The formulation of herbal soap is based on the traditional saponification process. Selecting a suitable base, such as oils and butters (e.g., coconut oil, olive oil, shea butter), combined with a lye solution (sodium hydroxide for solid soap or potassium hydroxide for liquid soap) to initiate the saponification process.

The natural oils or fats react with an alkali (sodium hydroxide for solid soap, potassium hydroxide for liquid soap) to form soap and glycerin. The addition of herbs and botanical extracts enhances the soap's medicinal value, providing antibacterial, antifungal, anti-inflammatory, and skin-rejuvenating benefits.

## **AIM AND OBJECTIVE**

### **AIM**

To provide a natural alternative to commercial soaps, avoiding synthetic chemicals and harsh detergents. To produce eco-friendly soap using sustainable, biodegradable ingredients and packaging. To create visually appealing soaps with pleasant natural fragrances.

### **OBJECTIVE**

The formulation and evaluation of herbal soap involve multiple objectives aimed at ensuring the product's efficacy, safety, and consumer acceptance. These can be broadly categorized into-

### Therapeutic Efficacy

Objective: Develop a soap formulation that effectively prevents and treat common skin issues such as rashes, redness, itching, allergy etc.

### Safety and Biocompatibility

Objective: Ensure the safety of the herbal soap for daily usage without causing any adverse effects on skin tissues and overall health.

### Consumer Acceptability

Objective: Create a product that is appealing to consumers in terms of colour, texture and fragrance.

### Stability and Shelf Life

Objective: Ensure the formulated herbal soap remains stable and effective over its intended shelf life.

### Natural and Sustainable Ingredients

Objective: Utilize natural, sustainably sourced ingredients to align with consumer preferences for eco-friendly.

## DRUGS AND EXCIPIENTS PROFILE

### BASE OILS ⚗

"Base oils" are the primary component of lubricants, making up 70–99% of the formulation. They serve as the foundation upon which additives are blended to enhance performance. ⚗ Base oils are a critical component in soap formulation—they determine the soap's cleansing ability, hardness, lather quality, and conditioning properties.

### COCONUT OIL →

Coconut oil is a popular ingredient in herbal soap due to its numerous benefits for the skin and overall soap quality.



**Fig.2.Coconut oil**

**BOTANICAL NAME:-** Cocos nucifera

**FAMILY:-** Arecaceae

**BIOLOGICAL SOURCE**

□ Coconut oil is derived from the kernel or meat of mature coconuts harvested from the coconut palm (*Cocos nucifera*). Specifically, it's extracted from the dried coconut meat, also known as copra.

**CHEMICAL CONSTITUENTS**

□ Fatty Acids

Coconut oil is composed of various fatty acids, including:

□ Lauric Acid: Approximately 45-52% of the fatty acids.

□ Myristic Acid: Around 16-21%.

□ Caprylic Acid: Approximately 5-10%.

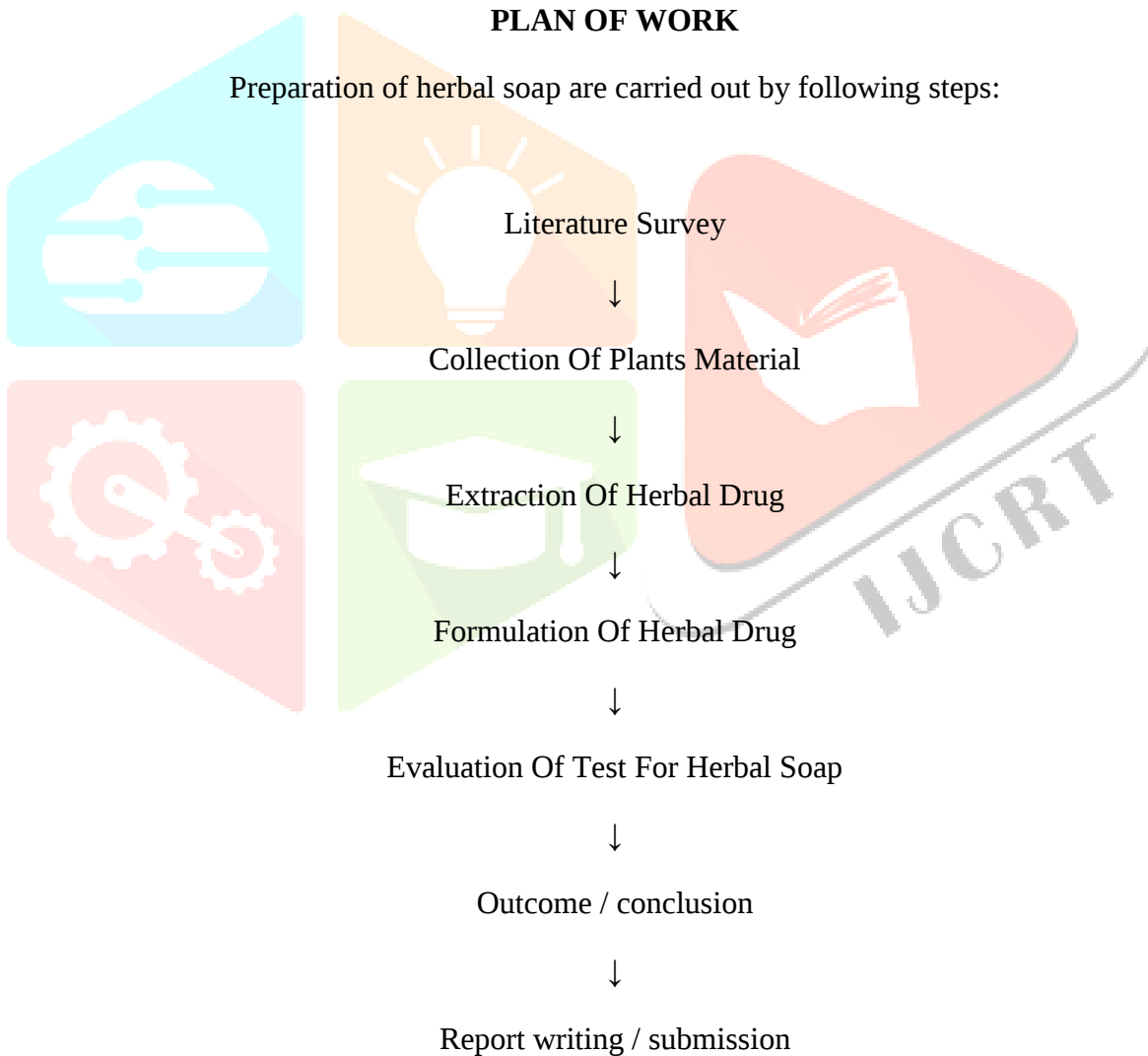
**ALMOND OIL**

□ Almond oil is a wonderful ingredient for soap making, especially in cold process or hot process soaps. It should be paired with harder oils (coconut oil, shea butter, palm oil) to create a balanced bar.



### PLAN OF WORK

Preparation of herbal soap are carried out by following steps:



**MATERIALS AND METHOD:-****FORMULATION OF HERBAL SOAP [250 gm]**

| S.NO | COMMON NAME      | BOTANICAL NAME          | PARTS USED       | CATEEGORY                                 | WEIGHT           |
|------|------------------|-------------------------|------------------|-------------------------------------------|------------------|
| 1    | Coconut oil      | Cocos nucifera          | Fruits           | Lather and cleansing                      | 75gm<br>[81 ml]  |
| 2    | Almond oil       | Prunus amygdalus dulcis | Seeds            | Moisturizing                              | 50gm<br>[54 ml]  |
| 3    | Palm oil         | Elaeis guineensis       | Fruits           | Hardness and stability                    | 50gm<br>[54 ml]  |
| 4    | Castor oil       | Ricinus communis        | Seeds            | Rich and creamy lather                    | 25gm<br>[27.3ml] |
| 5    | Bay leaves       | Laurus nobilis L        | Leaves           | Anti inflammatory and anti fungal         | 3gm              |
| 6    | Aloevera         | Aloe barbadensis mill   | Stem             | Soothing and moisturizing                 | 2gm              |
| 7    | Turmeric         | Curcuma longa           | Underground Stem | Brightening and Colourant                 | 1gm              |
| 8    | Tulsi            | Ocimum sanctum          | Leaves           | Anti microbial and skin purification      | 3gm              |
| 9    | Chamomile        | Matricaria recutita     | Flowers          | Calming and anti-irritant                 | 1gm              |
| 10   | Lavender oil     | Lavendula angustifolia  | Flowers          | Relaxation and healing                    | 1gm<br>[1.13ml]  |
| 11   | Tea tree oil     | Melaleuca alternifolia  | Leaves           | Anti-septic and acne treatment            | 1gm<br>[1.1ml]   |
| 12   | Peppermint oil   | Mentha piperita         | Leaves           | Cooling effect                            | 1gm<br>[1.2ml]   |
| 13   | Sodium hydroxide | –                       |                  | Alkaline agent for saponification process | 36gm             |
| 14   | Rose water       | Rosa damascena          | Flowers          | Anti-aging and herbal infusion            | 1gm<br>[1 ml]    |

## METHODS ▯ MELT AND POUR METHOD :-

The melt and pour method is a simple and beginner-friendly way to make herbal soap. It involves using a pre-made soap base that is melted, mixed with herbs and other ingredients, and then poured into molds to set. Here's a step-by-step:

**MATERIALS NEEDED** ♣ Melt and pour soap base (glycerine ,sodium hydroxide, goat milk, shea butter, etc.) ♣ Herbs (like lavender, chamomile, rosemary,—dried and finely ground is best) ♣ Essential oils (tea tree oil, lavender oil, etc.)

- ♣ Natural colorants (turmeric, etc.) ♣ Soap mold (silicone molds work well)
- ♣ Microwave-safe container or double boiler
- ♣ Stirring utensil (wooden stick or spoon)
- ♣ Spray bottle with rubbing alcohol (to eliminate bubbles)

### STEPS Cut the Soap Base:

- Cut the melt and pour soap base into small cubes for easier melting Melt the Soap:
- Use a microwave (in 30-second bursts) or a double boiler to melt the soap base, stirring in between until fully melted. Add Herbal Ingredients:
- Stir in dried herbs (1–2 teaspoons per 1 lb of soap) and any desired essential oils (usually 10–30 drops).
- You can also add natural colorants here. Mix Well: • Stir gently but thoroughly to distribute the ingredients evenly. Pour into Molds:
- Pour the mixture into your soap molds. Tap lightly to remove air bubbles. Spritz with Alcohol: • Spray the top with rubbing alcohol to eliminate surface bubbles. Let It Set:
- Allow the soap to harden for a few hours (or overnight) at room temperature.

## OTHER METHODS:-

There are various other methods for making soaps. They are as follows:

- ☐ Cold process method
- ☐ Hot process method

### ☐ COLD PROCESS METHOD

The cold process of making herbal soap is a traditional method that involves mixing oils with a lye solution (sodium hydroxide) to trigger saponification — the chemical reaction that creates soap. Adding herbs enhances the soap with natural color,

texture, and skin benefits. Here's a step-by-step guide:

## INGREDIENTS

- ☐ Olive oil
- ☐ Coconut oil
- ☐ Palm oil
- ☐ Castor oil
- ☐ Distilled water
- ☐ Lye (sodium hydroxide) (accurate amount depends on oil types; use a lye calculator)
- ☐ Dried herbs (e.g., lavender, chamomile, calendula)
- ☐ Essential oils (optional, for scent)

## TOOLS NEEDED

- ☐ Safety gear (gloves, goggles, long sleeves)
- ☐ Digital scale
- ☐ Thermometer
- ☐ Stick blender
- ☐ Stainless steel or heat-safe plastic bowls
- ☐ Soap mold
- ☐ Parchment paper or silicone liner (if using a non-silicone mold)

## STEPS

Prepare mold and workspace:

- ☐ Line your mold if needed.
- ☐ Ensure good ventilation and wear protective gear.

## EVALUATION OF HERBAL SOAP

The process of evaluating herbal soap involves a systematic approach to ensure safety, quality, efficacy, and compliance with regulatory standards. Below is a step-by-step breakdown of the evaluation process:

## Pre-Evaluation Preparation

- ☐ Define Objectives (e.g., skin safety, antimicrobial claims, moisturizing effects).
- ☐ Select Testing Parameters (physical, chemical, microbiological, stability, efficacy).
- ☐ Gather Samples (multiple batches for consistency testing).
- ☐ Review Formulation (check herbal ingredients, preservatives, base oils).

## Physical & Chemical Testing

### pH Test

- ☐ Method: Use a pH meter or pH strips with a soap solution.
- ☐ Acceptance Criteria: 5.5–7 (skin-friendly range).

### Total Fatty Matter (TFM) Test

- ☐ Method: Solvent extraction (as per IS 2888:1983).
- ☐ Acceptance Criteria:  $\geq 60\%$  (higher TFM = better quality).

### Free Alkali Test

- ☐ Method: Titration with HCl.
- ☐ Acceptance Criteria :  $\leq 0.1\%$  (excess alkali can irritate skin).

### Foaming Ability & Lather Stability

- ☐ Method: Shake diluted soap solution, measure foam height & duration.

### Moisture Content

- ☐ Method: Oven drying (loss on drying).
- ☐ Acceptance Criteria: Typically  $< 15\%$  (prevents microbial growth)

## Microbiological Testing

- ☐ Total Bacterial Count (TBC) ( $\leq 1000$  CFU/g)
- ☐ Yeast & Mold Count ( $\leq 100$  CFU/g)
- ☐ Pathogen Testing (E. coli, Salmonella, S. aureus, Pseudomonas – must be absent).
- ☐ Method: Agar plating (USP/ISO 11930).

## Stability & Shelf-Life Testing

Accelerated Stability Test:  $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , 75% RH for 3 months (simulates 1 year of storage). Check for color, odor, texture, pH, TFM changes.

Real-Time Stability Test : Store at room temperature ( $25^{\circ}\text{C}$ ) for 6–12 months, monitor

periodically.

Rancidity Test : Peroxide Value (PV) & Acid Value (AV) to check oil degradation.

Efficacy & Skin Safety Testing

Patch Test (Human or Animal) : Apply soap on skin (forearm/back), observe for redness, itching, irritation.

Antimicrobial Activity (if claimed): Agar Well Diffusion/Kirby-Bauer Test against bacteria/fungi.

Moisturizing Effect: Corneometer measures skin hydration before & after use.

Herbal Ingredient Verification

☐ TLC/HPLC to confirm active compounds (e.g., aloe vera polysaccharides, neem triterpenes).

☐ Essential Oil Analysis (GC-MS for purity).

Packaging & Labeling Check

☐ Leakage Test (for liquid soaps).

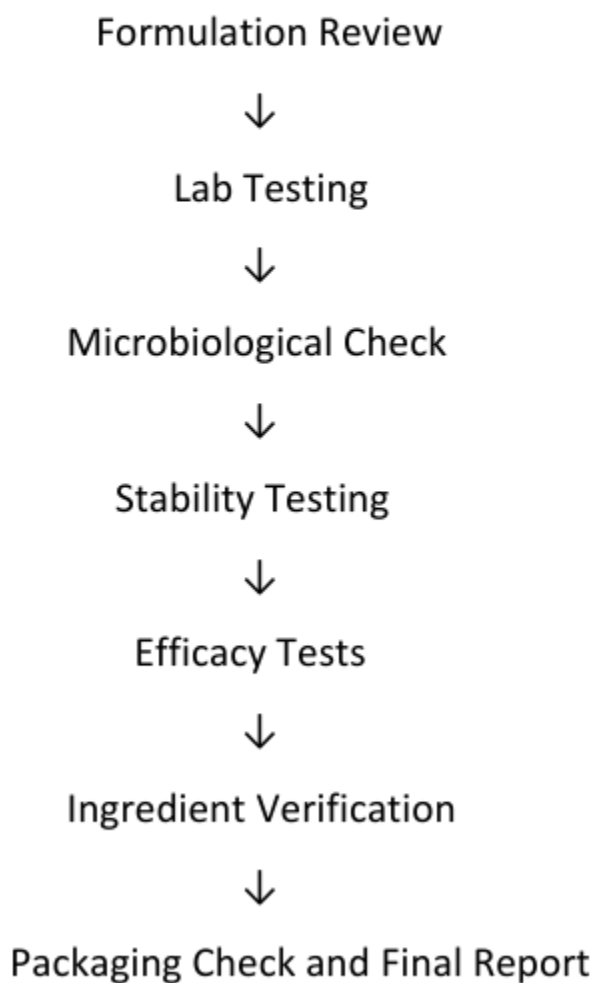
☐ Label Compliance (ingredients, expiry, manufacturer details, certifications).

Final Compliance & Certification

☐ BIS/ISO/GMP Certification (if applicable).

☐ FDA/EC Cosmetic Regulation Compliance (for export).

## Flowchart of Evaluation Process



### RESULT :-

The results of the formulation and evaluation of herbal soaps can vary depending on factors such as the specific ingredients used, the formulation process, and the evaluation criteria.

Here are some possible outcomes based on different aspects of the formulation and evaluation:

- Sensory Evaluation: If the herbal soaps are well-formulated and properly scented with natural essential oils and herbs, they may receive positive feedback in terms of appearance, color, texture, and fragrance. Consumers may appreciate the unique aromas and visual appeal of the herbal soaps.
- Safety: A thorough safety evaluation should ensure that the herbal soaps are free from harmful ingredients and are safe for use on the skin. If the formulation adheres to safety standards and passes patch tests for skin compatibility, it can be considered safe for consumers.
- Efficacy: Herbal soaps formulated with beneficial herbs and oils may demonstrate effective cleansing, moisturizing, and soothing properties. Positive results in efficacy testing may include improved skin hydration, reduced inflammation, or enhanced overall skin health compared to conventional soaps.
- Ingredient Quality: The use of high-quality herbs, oils, and additives in the formulation can contribute to the overall quality and performance of the herbal soaps. If the ingredients are sourced responsibly and meet quality standards, it can enhance the efficacy and safety of the final product.
- pH Level: Herbal soaps with a balanced pH level within the optimal range for skin health may receive favorable results in pH testing. Maintaining a slightly acidic pH can help support the skin's natural barrier function and prevent dryness or irritation.
- Stability: Proper formulation and packaging can help ensure the stability of herbal soaps over time. Positive results in stability testing may include resistance to oxidation, rancidity, and microbial contamination, leading to an extended shelf life and maintained product quality.

□ Moisturizing Effect: The presence of herbal extracts provided a noticeable moisturizing effect on the skin.

□ Foaming Ability: Adequate lather formation observed during use.

□ These results indicated that the formulated soap is effective, safe for topical application, and has potential for commercial or personal .

## CONCLUSION :-

- In the present work,herbal soap were prepared, with suitable size and shape, thickness, weight, and with good foam producing ability.
- Herbal soap of Bay leaves and tulsi were prepared for their anti-bacterial activity for the treatment of pimples, acne and scars.
- The formulations were characterized for different evaluation parameters like clarity, color, and odor, size, and shape, thickness, weight, pH in which they exhibited satisfactory results.
- The herbal soap showed a good appearance with yellow color and with a pleasant aromatic smell and showed good anti-bacterial properties.
- Based on the study it can be concluded that herbal products can be effectively formulated in the form of medicated herbal soaps by using cold process technique with excellent anti-bacterial properties.
- The formulation and evaluation of herbal soaps represent a significant exploration into the potential benefits of natural ingredients in skincare products.Through meticulous formulation and comprehensive evaluation processes, this study has unveiled promising findings regarding the efficacy and safety of herbal soaps.
- The inclusion of herbal extracts, essential oils, and other natural compounds has demonstrated tangible improvements in various skin parameters, including hydration, moisture retention, and overall skin health. Furthermore, the absence of harsh chemicals commonly found in conventional soaps highlights the potential of

herbal soaps to mitigate adverse skin reactions and sensitivities.

□ Moreover, the evaluation phase of this research has provided invaluable insights into the sensory attributes, stability, and shelf-life of herbal soap formulations.

□ By assessing factors such as texture, scent, lather, and durability, researchers can refine formulations to meet consumer preferences and industry standards effectively.

□ However, while the results are promising, further investigation is necessary to optimize formulation parameters, explore additional herbal ingredients, and assess long-term effects on skin health. Additionally, studies focusing on the ecological impact of herbal soap production and the potential for sustainability are warranted.

□ Overall, this research contributes to the growing body of knowledge supporting the development and utilization of herbal soaps as viable alternatives in the skincare industry, emphasizing their potential to promote skin health and environmental responsibility.

#### REFERENCE:-

- 1) Barel, A. O., Paye, M., & Maibach, H. I. (Eds.). (2014). Handbook of cosmetic science and technology (4th ed.). CRC Press.
- 2) □ Butler, H. (2000). Pouchers perfumes, cosmetics and soaps: Volume 3 - Cosmetics (10th ed.). Springer.
- 3) □ Evans, W. C. (2009). Trease and Evans pharmacognosy (16th ed.). Saunders Elsevier.
- 4) □ Flick, E. W. (2003). Cosmetic and toiletry formulations (Vol. 1, 2nd ed.). William Andrew Publishing.
- 5) □ Kokate, C. K., Purohit, A. P., & Gokhale, S. B. (2015). Pharmacognosy (50th ed.). Nirali Prakashan.
- 6) □ Worwood, V. A. (2016). The complete book of essential oils and aromatherapy (25th anniversary ed.). NewWorld Library.
- 7) □ Reddy, Y. R. R., Kumari, C. K., Lokanatha, O., Mamatha, S., & Reddy, C. D. (2013). Antimicrobial activity of Azadirachta Indica (neem) leaf, bark and seed extracts. Int. J. Res. Phytochem. Pharmacol, 3(1), 1-4.
- 8) □ Afsar, Z., Khanam, S., & Aamir, S. (2018) Formulation and comparative evaluation of polyherbal preparations for their disinfectant effects, 1 (1), 54-65.
- 9) □ Joshi, M. G., Kamat, D. V., & Kamat, S. D. (2008). Evaluation of herbal 10) handwash formulation. 7 (5), 413-15.
- 11) □ Dhanasekaran, M. (2016) International research journal of pharmacy. 7(2), 31-35.
- 12) □ Shivanand, P., Nilam, M., & Viral, D. (2010). Herbs play an important role in 13) the field of cosmetics. International Journal of PharmTech Research, 2(1), 632 639.

- 14) □ Amit, J., Subodh, D., Alka, G., Pushpendra, K., & Vivek, T. (2010). Potential of  
15) herbs as cosmaceuticals. International Journal of Research in Ayurveda and  
16) Pharmacy (IJRAP), 1(1), 71-77.  
17) □ Kapoor, V. P. (2005). Herbal cosmetics for skin and hair care.4(4). 306-315.  
18) □ Niharika, A., Aquicio, J. M., & Anand, A. (2010). Antifungal properties of neem  
19) (Azadirachta indica) leaves extract to treat hair dandruff. E-ISRJ, 2, 244-52.

