

# A Review on the Formulation and Evaluation of Polyherbal Antimicrobial & Antibacterial Soap

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## Abstract:

People have been using medicinal plants for centuries to treat various ailments. The extract from the leaves, stem, and roots of these plants has been a natural for many health issues [1]. The aim of the study is to formulate and evaluate polyherbal antimicrobial soap using Neem, Aloe vera, Turmeric, Tulsi, Coconut oil, Stearic acid, Glycerin, Sodium hydroxide, Almond oil, Reetha, Vitamin E capsule [5]. The purpose of the research work was to herbal soap offers several advantages over other soap [3]. The majority of existing soaps which has prepared from drugs of synthetic origin and give extras fairness to body [4]. The need to achieve and maintain healthy skin is on the rise. This causes the composition of antioxidant soaps with complex synthetic chemicals whose safety on skin and human health is still unclear [2]. The objective of this study is to formulate polyherbal soap for the beautification purpose. Hence, this study is concluded as the formulated polyherbal soap can be used as for the cleansing and beautification purpose [6].

**keywords:** Formulation, , skin care, polyherbal soap, antimicrobial activity , herbal cosmetic.

## 1.Introduction

Cleanliness is a totally essential issue due to the growing variety of diseases due to micro organism as and germs. The goal is to develop a cost-effective, natural product that provides effective cleaning and additional benefits for skin health. Due to the increasing demand for natural and chemical-free skincare product, poly-herbal soap has become popular in pharmaceutical, cosmetic, and Ayurvedic markets. It offers a safe and suitable for daily use for all skin types. According to definition, soap is a chemical compound aggregate produced whilst a metal radical interacts with a fatty acid. Any salt of those fatty acids that is water soluble and has 8 or more carbon atoms is cited be cleaning soap.



### Advantages of Polyherbal soap

- Soap removes dirt, oil, sweat, and impurities from the skin and surfaces.
- Helps kill or remove bacteria, viruses, and fungi from the skin.
- Natural soaps (specially herbal) are gentle and suitable for most skin types.
- Soap is cheap, long-lasting, and widely available everywhere.
- Many soaps contain glycerine, herbal extracts, and oils that nourish the skin

## 2.Classification of soaps

- Based on Usage

- i) Toilet Soap
- ii) Laundry Soap
- iii) Baby Soap

- Based on Form / Physical State

- i) Bar Soap
- ii) Liquid Soap

### iii) Powder Soap

- Based on TFM (Total Fatty Matter)

- i) Grade I:  $\text{TFM} \geq 76\%$
- ii) Grade II:  $\text{TFM} \geq 70\%$
- iii) Grade III:  $\text{TFM} \geq 60\%$

- **Based on usage**

#### I. Toilet Soap

- Toilet soap, also known as bathing soap or personal care soap, is primarily intended for cleansing the human body. It is formulated with ingredients that provide a gentle and moisturizing effect on the skin.
- Contains fatty acids derived from vegetable oils or animal fats.
- Saponification is the chemical reaction used to produce toilet soap.

#### II. Laundry Soap

- Laundry Soap, also referred to as washing soap or detergent bar, is specifically designed for cleaning clothes and other fabric.
- Contains surfactants, enzymes, builders, and bleaching agents.
- Common surfactants include sodium lauryl sulfate (SLS) or sodium dodecylbenzenesulfonate

#### III. Baby soap

- Baby soap is a gentle cleansing product specifically formulated for infants' delicate skin, often containing moisturizing and soothing ingredients like oatmeal and chamomile and being free from harsh chemicals, dyes, and preservatives.
- Has a pH level closer to a baby's skin, which helps maintain its natural protective barrier.

- **Based on form/Physical State**

#### I. Bar soap

- Bar soap is a solid cleansing product used for washing the skin and removing dirt, oil, and impurities. It is primarily made through a chemical process called saponification, where oils or fats react with an alkali (usually sodium hydroxide) to form soap and glycerin.

#### II. Liquid soap

- Easy to dispense
- More hygienic (less contamination compared to shared bar soap)
- Ideal for handwash, face wash and shampoos
- Safe for sensitive skin (depending on formulation)

#### III. Powder soap

- Powder soap is a dry, powdered cleansing product commonly used for washing clothes, utensils, and sometimes for general cleaning.
- It contains surfactants (cleaning agents) and other additives that help remove dirt, grease, stains, and microbes.

- **Based on TFM (Total Fatty Matter)**

#### I. Grade I: $\text{TFM} \geq 76\%$

- It is the highest quality category of toilet soaps.
- According to BIS (Bureau of Indian Standards), Grade I soap must have  $\text{TFM} \geq 76\%$ .
- This means the soap contains 76% or more pure fatty matter, mainly from oils and fats.

#### II. Grade II: $\text{TFM} \geq 70\%$

- The soap contains at least 70% pure fatty matter (oils and fats that have been converted into soap).
- Although BIS (Bureau of Indian Standards) defines Grade I TFM as  $\geq 76\%$  for toilet soap, some other soap categories (like laundry soap or herbal handmade soap) may consider 70% or above as Grade I.

### III. Grade III: TFM $\geq$ 60%

- TFM (Total Fatty Matter) is the measure of pure soap content present in a soap bar.
- When a standard mention Grade I TFM  $\geq$  60%, it means: The soap contain at least 60% pure Fatty matter.
- Which comes from natural oils and fats used in the soap-making process.

#### ❖ Ideal properties of polyherbal soap

- The soap should not cause skin irritation and should be gentle for all skin type.
- It is produce sufficient, stable from to satisfy consumer expectations for effective cleansing.
- It's have an appropriate moisture content (ideally 10-14%) to provide hydration to the skin without being greasy or drying.
- The primary function of any soap ensuring it effectively removes dirt and impurities.
- The finished product should be physically and chemically stable over its shelf life, without changes in color, odor, or performance.

#### ❖ Function of polyherbal soap

- It helps prevent skin infection, acne, and other conditions by using the natural properties of herbs like neem.
- Many herbal ingredient provide antioxidants, which can help protect the skin from damage, reduce wrinkles, and give a glowing effect.
- It helps soothe and calm irritated skin.
- Polyherbal soaps are rich in vitamins and minerals, helps nourish the skin.

#### ❖ Problem related to skin

- Skin irritation
- Allergic reaction
- Dryness
- Acne

### 3. Drug profile:

#### ❖ Reetha

- Biological name – *Sapindus mukorossi*
- Common name – Reeta, Soapnut, Indian Soapberry
- Synonyms – *Sapindus oocarpus* Radlk
- Kingdom – Plantae
- Family – Sapindaceae
- Genus – *Sapindus*
- Species – *S. mukorossi*
- Order – Sapindales
- Properties – Natural Cleanser / Surfactant



Fig:1. Reetha

#### ❖ **Neem**

- Biological name – *Azadirachta indica*
- Common name – Neem, Nimba, margosa tree
- Synonyms – malia azadirachta
- Kingdom – Plantae
- Family – Meliaceae
- Genus – Azadirachta
- Species – Azadirachta indica



Fig:2. Neem

#### ❖ **Tulsi**

- Biological name – *Ocimum tenuiflorum (Ocimum sanctum)*
- Common name – Tulsi, Holy Basil
- Synonyms – Tulasi, sacred basil
- Kingdom – Plantae
- Family – Lamiaceae
- Genus – Ocimum
- Species – *Ocimum tenuiflorum*



Fig:3. Tulsi

❖ **Aloe vera**

- Biological name – *Aloe vera (L.) Burm.f.*
- Common name – Aloe vera, Ghritkumari, Aloe
- Synonyms – *Aloe barbadensis miller*, *aloe indica royle*
- Kingdom – Plantae
- Family – Asphodelaceae
- Genus – Aloe
- Species – Aloe vera



Fig:4. Aloe vera

❖ **Turmeric**

- Biological name – *Curcuma longa*
- Common name – Turmeric
- Synonyms – *Curcuma domestica*, Haldi, Indian saffron
- Kingdom – Plantae
- Family – Zingiberaceae
- Genus – Curcuma
- Species – Curcuma longa



Fig:5. Turmeric

❖ **Coconut oil**

- Botanical name – Coconut
- Biological name – *Cocos nucifera*
- Common name – Coconut
- Synonyms – Nariyal, Cocos indica, Coconut palm
- Kingdom – Plantae
- Family – Arecaceae
- Genus – Cocos
- Species – Cocos nucifera



Fig:6. Coconut oil

**4. Material And Method**

S.no	Ingredients	Quantity(50g)	Properties
01	Reetha	6g	Natural cleanser / Surfactant
02	Neem	4g	Antifungal / Antibacterial
03	Tulsi	3g	Antimicrobial
04	Aloe vera gel	5ml	Moisturizer & smoothness
05	Turmeric	2g	Anti-inflammatory, Brightening
06	Coconut oil	4ml	Softening & nourishment
07	Vitamin E capsule	0.5ml	Antioxidant
08	Glycerin	2ml	Extra moisturization

09	Stearic acid	2g	Hardener, Thickener, Emulsifier
10	Sodium hydroxide	0.2g	Maintain pH, cleansing
11	Distilled Water	Up to 50 ml	Purity & stability

## 5. Conclusion:

The formulation and evaluation of polyherbal soap is a complex process that involves several considerations, such as the selection of appropriate plant or herbal ingredient formulation, the extraction process, and the evaluation of the safety and efficacy of the final product. Using herbal ingredients or plant extract in soap formulation offers several advantages, including improved skin health, reduced environmental impact, and decreased skin health. However, testing and evaluation are crucial to ensure the safety and efficacy of the product. Overall, the development and evaluation of herbal soap is an important area of research that can provide consumers with a more natural and sustainable option for hair care.

This study aimed to develop a herbal soap that would reduce skin problems while promoting skin brightening. Besides being safer than chemical product the soap formulation significantly reduced skin problems during combing and promoted healthy skin. The soap pH was adjusted to maintain the acidic environment of the skin, and a physicochemical method was used to preserve the formulation avoiding the risks associated with chemical preservatives. The poly herbal soap is expected to be more effective and safer than synthetic soap and will likely be well received by consumers, several plant or herbal ingredients are used in the soap, such as neem leaves, reetha, aloe vera, and tulsi, which provide skin benefits.

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