



A SYSTEMATIC REVIEW ON FORMULATION STRATEGIES OF HERBAL SOAP FOR TREATMENT OF ACNE AND PIMPLE

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How to cite this Article *Ravindra M. Hanwate, Nandini V. Jadhav, R. M. Kawade, N. S. Khairnar, Kishan Chavan (2025). A SYSTEMATIC REVIEW ON FORMULATION STRATEGIES OF HERBAL SOAP FOR TREATMENT OF ACNE AND PIMPLE, 2(4), 126-131.



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Article Info

Article Received: 04 October 2025,
Article Revised: 24 October 2025,
Article Accepted: 13 November 2025.

DOI: <https://doi.org/10.5281/zenodo.17641568>

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ABSTRACT

The research focuses on employing the melt-and-pour process to create an anti-herbal soap. Neem, masoor dal powder, orange peel powder, aloe vera gel, turmeric powder, lavender oil, coconut oil, and rose water are among the natural ingredients included in the herbal soap's formulation that are recognized for their skin-beneficial qualities. This formulation's goal is to provide a natural, potent treatment for acne and pimples that doesn't have the negative consequences of chemical-based solutions. Plant-based components having therapeutic qualities as antibacterial, antifungal, and anti-inflammatory actions are used in herbal cosmetics. The soap's raw plant ingredients soften skin, increase epidermal penetration, lessen acne, and encourage quicker healing and skin renewal. A number of physiochemical criteria, such as color, PH, foam, order, height, foam retention time, high-temperature stability, and skin irritation potential, were used to assess the manufactured herbal soap. The evaluation emphasizes the benefits of herbal soap over synthetic soap, such as its antibacterial qualities, mild nature, and natural ingredients. But there are drawbacks to herbal soap as well, like a shorter shelf life and the possibility of allergic responses. All things considered, herbal soap is a useful substitute for synthetic soap since it offers a safe, natural method of treating a variety of skin disorders.

KEYWORDS: Herbal Soap, Neem, Turmeric, Aloe Vera, Orange, Antimicrobial, Antioxidants, Essential Oils, Skin Care, Antibacterial.

INTRODUCTION

Skin breakouts, also referred to as "Yuvan Pidika" in Ayurveda, are a common skin disease in India. Affecting both adults and children. Pimples, zits, and whiteheads are caused by an oversupply of oil and dead skin cells clogging hair follicles. Acne can be improved by a variety of factors, including genetics, food, push, natural variables, and hormonal imbalances. Acne vulgaris can leave scars and create distress, which can lead to long-term problems with self-esteem. It is the ninth most prevalent disease worldwide, affecting 650 million people. Because of their anti-inflammatory qualities, herbal remedies have been used for ages to treat skin breakouts. Antimicrobial and skin-calming qualities. Whereas the logical prove supporting their adequacy

varies, several home grow fixings have appeared guarantee for diminishing skin break out injuries and making strides in general skin health. Herbal cures can be viable for a few people; it's fundamental to utilize them with caution and counsel with a healthcare proficient, particularly if you have touchy skin or fundamental wellbeing conditions. Anti-acne home grown cleansers are defined with characteristic fixings known for their capacity to combat acne and advance clearer, more beneficial skin. These cleansers regularly contain botanical extricates, basic oils, and other home-grown fixings that have antimicrobial, anti-inflammatory, and skin-soothing properties. Neem is a strong antibacterial and antifungal herb that makes a difference dispense with acne-causing microscopic

organisms, diminish aggravation, and alleviate aggravated skin. Turmeric contains curcumin, which has solid anti-inflammatory and antioxidant properties. Turmeric makes a difference calm skin break out aggravation, diminish redness, and advance skin mending. Aloe Vera is famous for its alleviating and moisturizing properties. It makes a difference reduce skin break out irritation, hydrate the skin, and advance the mending of skin break out injuries. Investigate recommends that orange peel contains compounds like flavonoids and vitamin C, which have antioxidant and anti-inflammatory properties. These properties may offer assistance in decreasing skin break out irritation and advancing by and large skin wellbeing. Additionally, masoor dal, when utilized as a topical fixing in skincare definitions or hand-crafted face Masks may have exfoliating properties due to their surface. Shedding can offer assistance expel dead skin cells. Unclog pores and advance a smoother complexion, which may be useful for acne-prone skin. Fuller's Soil has been customarily utilized for its oil-absorbing and skin-cleansing properties. It may offer assistance in removing overabundance oil, earth, and pollutions from the skin, hence anticipating skin break out breakouts and advancing a clearer complexion. Studies recommend that it may offer assistance in combating acne-causing microbes, lessening aggravation, and promoting wound mending. Rose water has a long history of utilize in skincare for its alleviating and hydrating properties.

It might help reduce acne-related redness, balance pH levels, and soothe irritated skin. Acne is a follicular skin condition that affects approximately 85% of teenagers and can persist into adulthood. Common symptoms include blackheads, inflammatory lesions, and scaly red skin. Its aetiology includes alterations in pilosebaceous unit structures brought on by androgens. Despite the use of antibiotics in traditional therapies, antibiotic-resistant microorganisms are emerging. Herbal alternatives based on Ayurveda are growing in popularity due to their minimal side effects.^[1] Using the healing properties of natural herbs, herbal soaps are a valuable skincare product that can help with a wide range of illnesses and skin issues.

SKIN

Skin, the largest organ in the body, covers the external surface and consists of three layers: dermis, hypodermis, and epidermis. It serves as the body's first line of defence against pathogens, UV radiation, and physical damage. Keratinocytes produce protective protein keratin, while collagen and lipocytes make up the dermis and subcutaneous tissue. The thickness of these layers varies depending on location.^[4]

STRUCTURE OF SKIN

The skin is made up of the basement membrane, which holds the dermis to the epidermis, which is mainly made up of keratinocytes. Beneath the dermis, the hypodermis, which is thick with fat, acts as a cushion and an insulator.

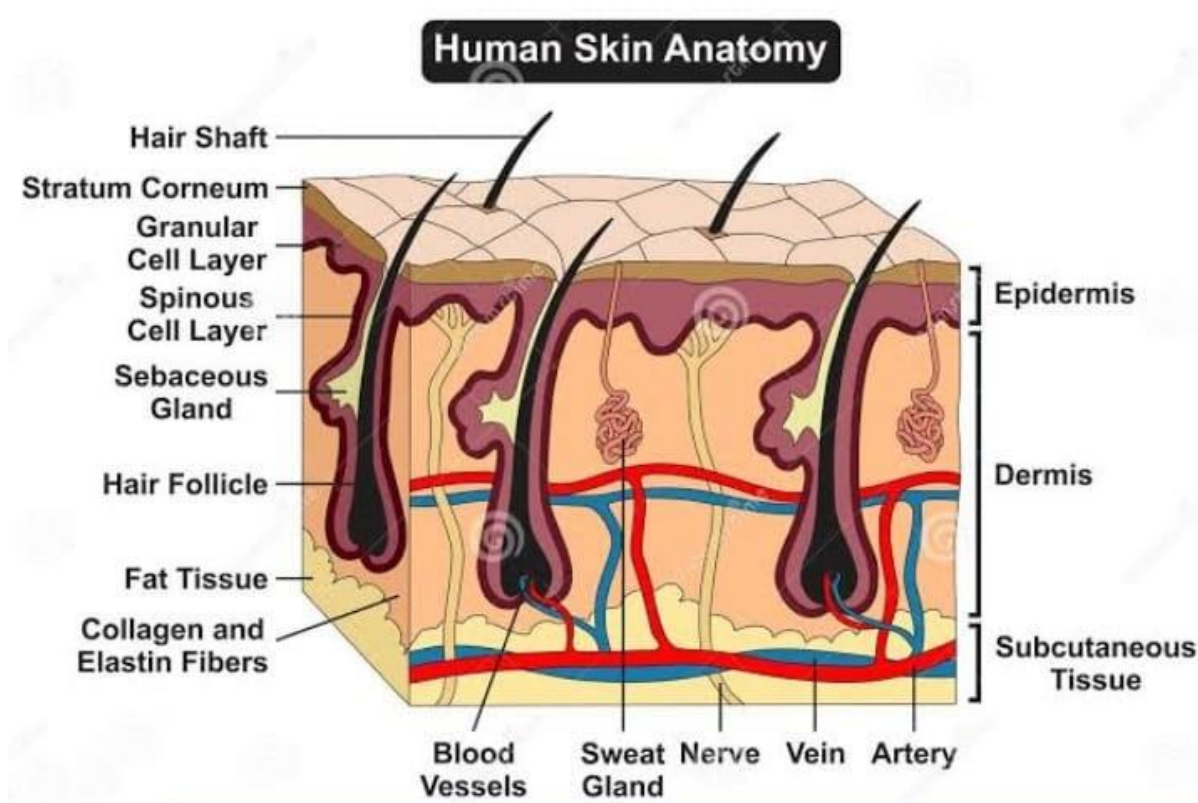


Fig 1: Layers of skin.

1. EPIDERMIS

The keratinocytes that produce keratin create the stratified squamous epithelium that makes up the epidermis, which acts as a barrier to protect the body. It is composed of five layers: stratum corneum, stratum lucidum, stratum granulosum, stratum spinosum, and stratum basal. Keratinocytes, melanocytes, Langerhans cells, and Merkel cells are among the several cell types found in these layers. The dermo-epidermal junction, which is essential for preserving skin integrity and function, maintains the cohesiveness between the dermis and epidermis.

2. DERMIS

Fibroblasts, mast cells, neurons, and circulatory networks can enter the dermis, an integrated connective tissue system, which guarantees tensile strength, elasticity, sensory input, and protection from injury. Through its contact with the epidermis, it creates predictable depth-dependent organisation of connective tissue components, resulting in structures like dermal-epidermal junctions and epidermal appendages. The dermis, which is mostly made up of collagen and other matrix elements like elastic fibres, is subject to turnover and remodelling in response to different stimuli, which preserves the integrity and functionality of the skin.

3. HYPODERMIS

Fat cells, or lipocytes, start to form in the subcutaneous tissue around the end of the fifth month of embryonic development. These cells are separated from one another by massive blood arteries and fibrous septa made of collagen. The thickness of this adipose layer, known as the panniculus, varies depending on the area of the body. It stores energy and functions as an endocrine organ. Here, hormones are converted, such as androstenedione to estrone by aromatase, and leptin, which is produced by lipocytes and controlled by the brain, contributes to the regulation of body weight.

TYPES OF SKIN

1. Normal Skin

Normal skin is neither too dry nor oily. Normal skin is smooth, has little pores and is balanced physically and functionally.

2. Dry Skin

The lack containing water in the epidermis causes the condition known as dry skin. Dry skin can occur in people for a number of reasons. Sunlight, chilly temperatures, and dry conditions all cause skin to become parched. Additionally, atopic dermatitis, diabetes, and hypothyroidism can all be triggered by dry skin.

3. Oily Skin

Sebum-Producing Skin During puberty, young people usually have oily skin. Environmental factors like UV radiation, chemicals and cosmetics, as well as genetic, hormonal, nutritional and stressor factors, can all

contribute to oily skin. Typically, people with oily skin get acne and dandruff.

4. Combination Skin

It might be called oily and dry skin or normal and oily skin. The T-zones on the forehead, nose and chin look greasy, but the rest of the skin is either normal or dry.

Plant Profile used in herbal Soap

1. Aloe Vera

- Biological name - Aloe barbadense miller
- Common name Indian -Aloe and Burn Aloe
- Family - Liliaceae
- Part typically used – leaves
- Colour– Green
- Chemical Constituents - Vitamin, enzyme, minerals, sugars, lignin, Saponin, salicylic acid and amino acid.



2. Neem

- Botanical name - Azadirachtolide indicia
- Family - Meliaceous
- Part typically used - Leave.
- Colour - Green.
- Active Constituents - flavonoids, Alkaloids, Azapirone, nimbi, Nimbi din, terpenoid, steroids



3. Turmeric

- Biological name - curcuma longa
- Common name - Haldi

- Family - Zingiberoside
- Part typically used - root
- Chemical Constituents - curcumin, desmethoxycurcumin, and Bisdemethoxycurcumin.^[23]



4. Reetha

- Biological name - Sapindasmokoros'
- Common name Indian - soapberry
- Family -Sapindaceous
- Part typically used - Seeds
- Chemical Constituents - saponins, sugars and mucilage.



5. Tulsi

- Biological name - Ocimum cteniform.
- Common name - holy basil]
- Chemical constituents - eugenol, oleanolic acid
- Part used - leaves.
- Colour - Green.



Type of soap:

1] Laundry soaps: Laundry soaps are formulated to eliminate grease, solid particle and organic compounds from clothes. They can be found in liquid, powder and gel forms.

2] Cleaning soaps: Cleaning soaps have different formulation to clean grease and soli. The difference between cleansers and cleaning soaps is that cleaning soap don't contain harsh abrasives.

3] Personal soaps: This kind of soap is made in many forms and special formulation for specific personal hygiene need. One types of the personal soap is the antibacterial soap that is made to prevent bacteria and viruses from spreading.

4] Novelty soaps: Novelty soaps are especially manufactured for the kids and include the soaps in the shapes of various items, such as a rubber ducky or the soap on the rope. There are made not only to clean dirt and grime, but for amusement and enjoyment as well.

5] Perfumed soaps: Perfumed soaps are product by adding a few additional ingredients and perfume.

6] Guest soaps: Guest soaps are miniature soaps that are made and shaped into attractive shapes and they are basically designed for the use by guests either in the main bathrooms or separate guest bathroom. Popular and commonly used shapes are flowers, sea shells and rounds.

7] Beauty soaps: Beauty soaps are produced to feature attractive fragrance and ingredients for a variety of skin types. They can feature glycerine or special oil blends.

8] Medicated soaps: Medicated soap and original soap are very similar. Unlike original soap, medicated soap has the addition of antiseptics and disinfectants.

9] Glycerine soaps: Glycerine is a normally produced during the process of soap production. Soaps which include glycerin in then tend to make your skin feel moister.

10] Transparent soap: Transparent soap uses slightly different ingredients and usually some form of alcohols to alter the process which is also conducted at higher temperature.

Not all transparent soap are glycerin soaps.

Characteristics

Soaps are the sodium salts of carboxylic acids in long chains. Sodium salts of long-chain benzene sulphonic

acids are detergents. Soaps are biodegradable while some of the detergents cannot be biodegraded. Soaps have relatively weak cleaning action, whereas detergents have a strong cleaning effect. • We cure all our soaps selling, to achieve a desirable hardness. • A soap that is difficult to rinse off is not a quality soap. Benefits: • • Herbal soaps actually soap and not bars of detergent. • Herbal soaps are free of harmful synthetic detergents and foaming agents. • It moisturizes your hands better and longer with glycerin. • Herbal soap is made with a variety of natural.

EVALUATION TEST

1. Physical parameters:

A number of features can be used to evaluate the physical qualities of soap. When contrasted with a white background, clarity is defined as the transparency or translucency that denotes the lack of contaminants. Examining the colour of the soap entails determining its hue, which can vary from clear to different tones based on natural or added substances. The process of evaluating soap's odour includes identifying its aroma, which can be either aromatic or unscented. By using touch to evaluate texture and consistency, one may determine how soft, firm, or smooth the soap is. Finally, the proportions and configuration of the soap bar are determined by size and shape, which are also physical factors.

2. pH

The pH range of the skin is 5.4 to 5.9. A 10% concentration soap solution was carefully made by dissolving 10 grams of soap in 100 millilitre volumetric flask of distilled water. A pH meter was used to measure the pH; the electrode was submerged in the solution, and the pH was then recorded.

3. Percentage free alkali

150 millilitres of distilled water were added to a beaker that held 10 grams of dried soap. The solution was heated for thirty to forty minutes on a water bath under reflux conditions in order to dissolve the soap. Following cooling, the solution was moved to a 250 ml conical flask along with washings, and the volume was adjusted using distilled water. Ten millilitres of the soap solution in the titration flask were mixed with two drops of the phenolphthalein indicator during the titration procedure. The solution was titrated up to a colourless condition using 0.1M HCl. The Bureau of Indian Standards (BIS) states that high-quality soaps should include no more than 5% alkali, while the ISO specifies that the minimum amount of alkali in soaps should be 2%.

5. Foam height

In a 100 ml graduated measuring cylinder, around 1.0 grams of herbal soap was dissolved in about 50 ml of distilled water. After roughly ten minutes of shaking the mixture, the foam height was measured. Next, based on five consecutive experiments, the mean was determined.

The foam height should be at least of 9cm for a good formulated soap.

5. Foam retention

A 100 ml measuring cylinder was filled with 25 millilitres of a 1% soap solution that had been made. After securing the cylinder with a hand cover, it was forcefully shaken for ten minutes. For four minutes, the volume of foam was measured at one-minute intervals.^[36] The foam height should have retention time of 5 min.

6. Antimicrobial test

The disc diffusion method was used in the antibacterial experiment against two strains of bacteria: Gram-positive (*B. subtilis*) as well as Gram-negative (*S. Typhi*). A 100 μ l culture of each microbe, which is containing roughly 100–150 CFU/ml, was used to seed nutrient agar plates. 6 mm diameter discs of filter paper saturated in 400 μ l of the testing solutions were carefully set on the agar plates after drying and sanitizing. After incubating the extracts for 24 hours at 37 °C, the width of the zone of inhibition was measured in millimetres to assess the extracts' antibacterial activity.

7. Antioxidant activity

Using the reducing power method, which measures antioxidant activity as an increase in the absorbance of the reaction mixture, greater antioxidant activity or reducing power is determined. The process is mixing 1 ml of the test sample diluted with distilled water (2.5 ml) with 2.5 ml of 0.2 Molar phosphate buffer (pH 6.6) and a 1% w/v solution of potassium ferric Cyanide. The mixture is recovered after 20 minutes at 50 °C, and 2.5 ml of 10% $C_2HCl_3O_2$ is added. The upper supernatant layer (2.5 ml) is combined with 0.5 ml of 0.1% ferric chloride and 2.5 ml of filtered water after centrifugation for 15 minutes at 250 rpm. After being exposed to UV light at 700 nm, the resultant solution's antioxidant activity is measured and contrasted with a control.

8. Acne lesion count

For assessment, a rating system with a range of 0 (no acne) to 10 (the worst possible acne) was used. Subcategories with fractions of 0.25 were established, ranging from 0 to 2. Individuals who scored 0.25 to 1.5 were classed as having physiological acne, also known as minor acne, and those who scored 1.5 or greater were categorized as having clinical acne, often known as "major acne".

CONCLUSION

The research shows that the herbal soap composition is safe and effective for treating acne. The new soap's pleasant sensory properties, stability, and skin compatibility make it a viable anti-acne skincare solution. Further research could look at long-term efficacy and user satisfaction to validate its market potential. Incorporating continual quality control techniques is also essential to ensure consistency in

product performance and safety laws. All things considered, the effective composition and evaluation of the anti-acne herbal soap constitute a substantial contribution to the cosmetics industry, offering a sensible and safe option for anybody wishing to avoid or treat acne.

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