



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Research Article

The Formulation and Evaluation of Poly Herbal Soap for Treatment of Acne and It's Associated Disorder

Kiran Makwana*, Krushal Sapariya, Dhara Siddhpuria, Rahul Shah, Shivam Singh, Abdul Basit.

Shree Dhanvantary Pharmacy College, Kim, Surat, Gujarat, India.

ARTICLE INFO

Published: 27 jun. 2026

Keywords:

Herbal Soap, Neem, amla, green tea, liquorice, Aloe Vera, Orange peel, green extraction method, herbal preparation.

DOI:

10.5281/zenodo.20965704

ABSTRACT

Herbal anti-acne soap was formulated using natural ingredients including neem, aloe vera, amla, green tea, licorice, and orange peel extracts. These herbal ingredients possess antibacterial, antifungal, antioxidant, and anti-inflammatory properties that are beneficial for maintaining healthy skin and reducing acne. The objective of the present study was to prepare and evaluate a polyherbal soap using eco-friendly extraction methods. Herbal extracts were prepared by aqueous, ethanolic maceration, and reflux extraction techniques and incorporated into a glycerin soap base. The prepared soap was evaluated for physicochemical parameters such as color, odor, texture, pH, foam height, foam retention, washability, thermal stability, moisture content, and skin irritation. The formulation exhibited satisfactory foaming ability, acceptable pH, good stability, and no signs of skin irritation. The results suggest that the formulated herbal soap can be used as a safe and effective natural alternative for acne-prone skin.

INTRODUCTION

The skin is the largest organ of the human body, forming a protective barrier against physical, chemical, and biological hazards. It plays vital roles in thermoregulation, prevention of water loss, sensation, and immune defense. The skin is associated with sebaceous and eccrine glands, which contribute to its physiological functions. [1-2]

Skin care products are formulated to cleanse, nourish, and improve skin texture and appearance. Among these, soap is a common cosmetic preparation used to remove sebum, dirt, and environmental pollutants. Herbal soaps, derived from plant-based ingredients, offer a natural alternative to synthetic soaps, which may cause irritation and other adverse effects.

***Corresponding Author:** Kiran Makwana

Address: Shree Dhanvantary Pharmacy College, Kim, Surat, Gujarat, India.

Email ✉: kiran1993makwana@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



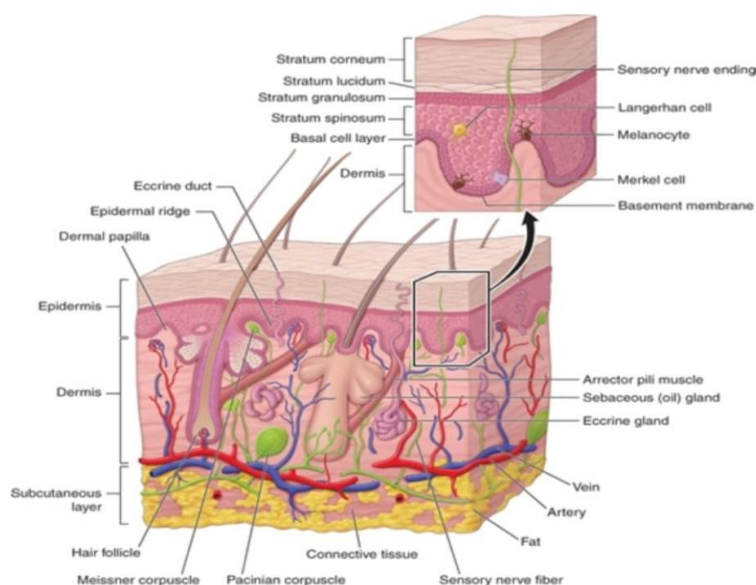


Figure No: 1 Structure of Skin

1.2 Structure and Function of Skin ^[3]

The skin consists of three layers:

- **Epidermis:** Outermost layer composed of keratinized stratified squamous epithelium. It provides protection and prevents water loss.
- **Dermis:** Middle layer containing connective tissue, collagen, elastin, blood vessels, nerves, and glands. It provides strength, elasticity, and sensation.
- **Hypodermis:** Deep layer composed of adipose tissue, responsible for insulation, energy storage, and anchorage.

1.3 Functions of Skin ^[4]

- Protection
- Thermoregulation

- Sensation
- Excretion
- Vitamin D synthesis

1.4 Common Skin Problems ^[5]

- **Acne:** Caused by blockage of hair follicles due to excess sebum and bacteria
- **Skin infections:** Bacterial, fungal, or viral origin
- **Dermatitis:** Inflammatory condition (e.g., eczema, contact dermatitis)
- **Dry skin (Xerosis):** Due to moisture loss
- **Pigmentation disorders:** Includes hyperpigmentation and hypopigmentation
Acne Vulgaris complications



Figure No: 2 Types of Acne

1.5 Herbal Soap

Herbal soaps are cosmetic formulations prepared using plant extracts for cleansing and improving skin health. They provide effective cleansing with minimal side effects and are gaining popularity due to increased awareness of the harmful effects of synthetic products. [6-7]

1.6 Functions of Soap:

- Cleansing
- Emulsifying
- Deterging
- Solubilizing
- Safe and eco-friendly

1.7 Ideal Characteristics of Herbal Soap

- Effectively remove dirt and excess sebum
- Produce adequate foam
- Be easily washable
- Leave skin soft, smooth, and non-dry
- Provide pleasant fragrance
- Be non-irritant and safe for skin and eye

1.8 Common Skin Problems

- Acne: Caused by blockage of hair follicles due to excess sebum and bacteria

- Skin infections: Bacterial, fungal, or viral origin
- Dermatitis: Inflammatory condition (e.g., eczema, contact dermatitis)
- Dry skin (Xerosis): Due to moisture loss
- Pigmentation disorders: Includes hyperpigmentation and hypopigmentation

1.9 Benefits of Selected Herbal Ingredients

Neem: Antibacterial, anti-inflammatory; effective against acne and infections [8-10]

Amla: Rich in vitamin C; improves skin glow, elasticity, and reduces aging [13]

Green Tea: Antioxidant; controls oil, reduces acne, and improves complexion [11,12]

Liquorice: Skin brightening, anti-inflammatory, reduces pigmentation [15]

Orange Peel: Rich in antioxidants; improves skin tone and texture [14]

1.10 Herbal Drug used for preparation of herbal soap



Figure No: 3 Neem leaves



Figure No: 4 Licourice root



Figure No: 5 Amla Fruit



Figure No: 6 Orange peel



Figure No: 7 Green tea leaves



Figure No: 8 Aloevera gel

❖ **Aloe vera** ^[6,7]

Common Name: Aloe, Burn Aloe

Biological Source: Dried juice of leaves of Aloe barbadensis Mill.

Family: Liliaceae

Chemical Constituents: Vitamins (A, C, E, B-complex), enzymes (amylase, lipase), minerals (Ca, Mg, Zn), polysaccharides (glucomannans), lignin, saponins, salicylic acid.

Uses: Scalp health, hair growth, reduce hair loss; topical agent for skin conditions; laxative; pharmaceutical applications.

❖ **Green Tea** ^[11,12]

Common Name: Tea plant

Biological Source: Dried leaves and buds of *Camellia sinensis*

Family: Theaceae

Chemical Constituents: Polyphenols (catechin, epicatechin, epigallocatechin, ECG, EGCG), alkaloids (caffeine), flavonoids, amino acids.

Uses: Anti-inflammatory, anti-acne, sebum regulation, anti-aging, antioxidant, antimicrobial.

❖ **Liquorice** ^[15]

Common Name: Mulethi, Sweet wood

Biological Source: Dried roots and stolons of *Glycyrrhiza glabra* Linn.

Family: Fabaceae

Chemical Constituents: Triterpenoid saponins (glycyrrhizin), flavonoids (liquiritin, isoliquiritin), chalcones.

Uses: Anti-inflammatory, demulcent, expectorant, antimicrobial, antioxidant, skin whitening, depigmentation, wound healing.

❖ **Amla** ^[13]

Common Name: Indian gooseberry, Awla

Biological Source: Dried fruit of *Phyllanthus emblica*

Family: Phyllanthaceae

Chemical Constituents: Vitamin C, tannins (emblicanin A & B), phenolic compounds (gallic acid, ellagic acid), flavonoids, amino acids.

Uses: Antioxidant, anti-aging, wrinkle reduction, skin rejuvenation, anti-inflammatory.

❖ **Orange peel** ^[14]

Common Name: Sweet orange

Biological Source: Fresh fruit and peel of *Citrus sinensis* (L.) Osbeck

Family: Rutaceae

Chemical Constituents: Vitamin C, flavonoids (hesperidin, naringin), phenolic compounds, carotenoids, pectin.

Uses: Antioxidant, anti-tyrosinase, anti-inflammatory, wrinkle reduction, skin barrier enhancement, UV protection, pigmentation, wound healing.

❖ **Neem** ^[8-10]

Common Name: Indian lilac

Biological Source: Leaves, seeds, bark, and oil of *Azadirachta indica* A. Juss.

Family: Meliaceae

Chemical Constituents: Flavonoids (quercetin, kaempferol), alkaloids, terpenoids (azadirachtin), nimbin, nimbidin, glycosides, tannins

Uses: Anti-acne, antifungal, anti-inflammatory, antiseptic, oil control, skin purification, antioxidant, photoprotective, sebum reduction.

Table No.1 Uses of ingredients of herbal soap

| Sr No. | Ingredients | Use of Ingredients |
|--------|-------------|--|
| 1 | Aloevera | Moisturizer, soothing and anti-inflammatory effect |
| 2 | Amla | Antioxidant, skin brightening |



| | | |
|---|----------------|---|
| 3 | Green tea | Reduces excess oil, antibacterial |
| 4 | Licorice | Reduces dark spots, Skin whitening |
| 5 | Orange peel | Deep cleansing of pores, control oiliness |
| 6 | Neem | Antibacterial, antifungal, detoxifier |
| 7 | Soap base | Vehicle |
| 8 | Red sandalwood | Coloring agent |
| 9 | Lavender oil | Fragrance |

2. Material and Methodology

Table No. 2 Quantity taken of ingredients for preparation of herbal soap

| Sr No | Ingredients | Quantity Taken |
|-------|----------------|----------------|
| 1 | Aloevera | 8ml |
| 2 | Amla | 5ml |
| 3 | Green tea | 4ml |
| 4 | Liquorice | 3ml |
| 5 | Orange peel | 3ml |
| 6 | Neem | 15ml |
| 7 | Soap base | 500g |
| 8 | Red sandalwood | Q.S |
| 9 | Lavender oil | 2ml |

Green method for preparation of herbal soap with herbal extract:



Figure No: 9 Extraction of herbs by water maceration

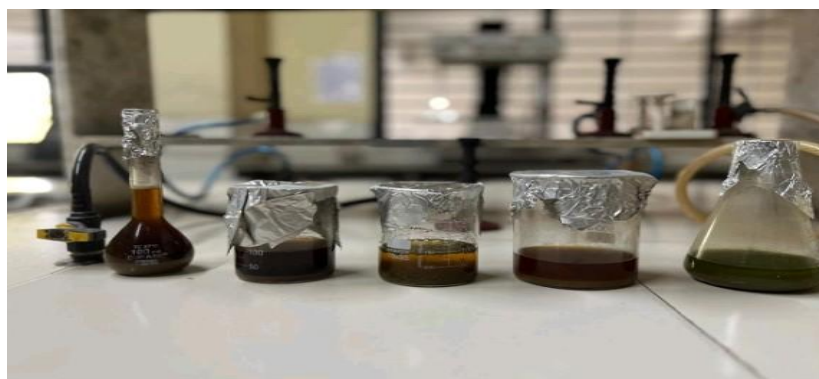


Figure No: 10 Extraction of all herbs

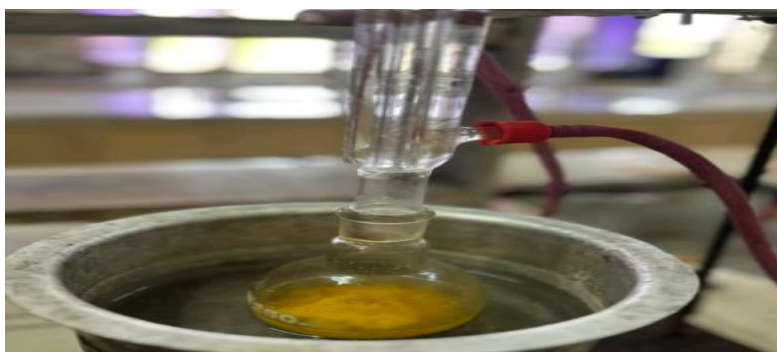


Figure No: 11 Reflux condensation



Figure No: 11 Formation of soap using soap base

A. Aqueous & Ethanolic Maceration - Neem,
amla, Aloe Vera, green tea, liquorice

Herbal Drug Powder

↓

Add Solvent (Water / 90% Ethanol)

↓

Maceration (72 h, Room Temp, Occasional
Shaking)

↓

Heating (50–60°C, 20 min)

↓

Cooling (Room Temperature)

↓

Filtration

↓



Storage (Amber-Colored Bottle)



B. Reflux Extraction- Orange peel

Add Herbal Extracts → Mix Gently

Herbal Drug Powder



Cool to 45°C

Add 70% Ethanol + Porcelain Pieces (in RBF)



Add Lavender Oil

Reflux Heating (60–70°C, 60 min)



Pour into Molds

Cooling (Room Temperature)



Spray Ethanol (Remove Air Bubbles)

Filtration



Keep Undisturbed (24 h, Room Temp) And Demolding & Storage

Storage (Amber-Colored Bottle)

C. Preparation of Herbal Soap

Selection of Herbal Extracts

(Neem, Amla, Aloe Vera, Licorice, Orange Peel, Green Tea)



Mix Extracts Uniformly



Prepare Colored Glycerin

(Glycerin + Red Sandalwood)



Melt Soap Base (500 g, Water Bath)



Add Colored Glycerin → Mix



Cool to 50°C

3. Evaluation parameter of Herbal soap Parameters^[20-23]

- **Physical Appearance:**
Soaps were examined for color, odor, texture, smoothness, and foam-producing ability
- **pH Determination:**
pH was measured using indicator paper by comparing color change with a standard chart.
- **Moisture Content:**
Soap (10 g) was dried at 115 °C until constant weight.
$$\text{Moisture Content (\%)} = (W_2 - W_1) / W_1 \times 100$$
- **Thermal Stability:**
Samples were exposed to temperatures above 40 °C and observed for stability.
- **Foaming Ability and Stability:**
Measured by cylinder shaking method; foam volume recorded initially and after 1 and 4 min.
- **Foam Height:**



1 g soap in 50 mL water was shaken, and foam height measured; ≥ 9 cm indicated good quality.

4. RESULT AND DISCUSSION



Figure No: 12 pH of soap



Figure No: 13. Skin irritability test

Table No.3 Organoleptic properties of Soap

| Sr no. | Name of Test | Observation |
|--------|--------------|--------------|
| 1 | Colour | Brownish red |
| 2 | Odour | Pleasant |
| 3 | Texture | Smooth |

Table No.4 Foam stability time

| Time | Foam height(cm) | % Foam retention |
|-------|-----------------|------------------|
| 0min | 9.5 | 100 |
| 1 min | 9.0 | 94.7 |
| 2 min | 8.6 | 90.5 |
| 3 min | 8.3 | 87.3 |
| 4 min | 8.0 | 84.2 |

Table No.4 Physiochemical and performance evaluation of herbal soap

| Sr no. | Test | Observation |
|--------|-----------------|-----------------------------|
| 1 | pH | 7 +_0.6 |
| 2 | Solubility | Easily soluble in water |
| 3 | Skin irritation | No harmful effect on skin |
| 4 | Foaming ability | Good foaming ability |
| 5 | Stability | Very stable |
| 6 | Washability | Easily and readily washable |
| 7 | Dirt dispersion | Good |

| | | |
|----|------------------------------|-----------------------------|
| 8 | Nature of skin after washing | Soft and smooth |
| 9 | High temp stability | Slight softening but stable |
| 10 | Foam height | 9.5cm |
| 11 | Hardness test | hardness |
| 12 | Moisture content | 2.9% |

5. CONCLUSION

The present study successfully formulated and evaluated a polyherbal anti-acne soap using natural ingredients such as neem, aloe vera, amla, green tea, licorice, and orange peel. The prepared soap demonstrated satisfactory physicochemical characteristics including acceptable pH, good foam retention, thermal stability, washability, and absence of skin irritation. The herbal ingredients contributed antibacterial, antioxidant, and anti-inflammatory properties which may help in reducing acne and improving skin health. The use of eco-friendly extraction methods and natural ingredients makes the formulation safe and suitable for regular use. Overall, the developed herbal soap can serve as an effective and economical alternative to synthetic anti-acne soaps.

REFERENCE

- Gade V.K., et al. (2025). Formulation and Evaluation of Herbal Neem Soap. *International Journal of Innovative Research in Technology*
- Kadve S.L., et al. (2024). Formulation and Evaluation of Herbal Soap for Acne Using Natural Ingredients. *IJSART*.
- Bhimsen S.K. (2025). Formulation and Characterisation of Herbal Neem Soap. *International Journal of Research in Pharmacy and Allied Science*.
- Osahon O.V. (2026). Production and Antimicrobial Properties of Neem-Based Herbal Soap. *Microjournal Research Floor*.
- Ghanwat A., et al. (2023). Formulation and Evaluation of Herbal Soap. *IJCRT*.
- Anonymous (2026). Formulation and Evaluation of Herbal Soap. *ResearchGate Publication*.
- WJBPHS (2023). Development and Evaluation of Natural Polyherbal Soap.
- B. Aloe Vera & Skin Pharmacology (MDPI / Reviews)
- Salehi B., et al. (2018). Aloe Genus Plants: From Farm to Food Applications and Pharmacological Properties. *MDPI – International Journal of Molecular Sciences*.
- Surjushe A., et al. (2008). Aloe vera: A Short Review. *Indian Journal of Dermatology*.
- Chelu M., et al. (2023). Aloe vera-Based Hydrogels for Wound Healing. *MDPI – Gels*.
- Levin N.J., et al. (2022). A Systematic Review of Aloe vera in Burn Healing. *Springer (Cureus)*.
- IJNRD (2023). Formulation and Evaluation of Aloe Vera Herbal Soap. C. Neem, Antimicrobial & Anti-Acne Studies
- Subapriya R., Nagini S. (2005). Medicinal Properties of Neem Leaves. *Current Medicinal Chemistry*.
- Biswas K., et al. (2002). Biological Activities and Medicinal Properties of Neem. *Current Science*.
- Alzohairy M.A. (2016). Therapeutics Role of *Azadirachta indica* (Neem). *Pharmacognosy Reviews*.
- D. Green Tea, Antioxidant & Skin Effects Khan N., Mukhtar H. (2013). *Tea Polyphenols*



- for Health Promotion. Life Sciences (Elsevier).
18. Chacko S.M., et al. (2010). Beneficial Effects of Green Tea: A Literature Review. Chinese Medicine.
 19. E. Amla, Orange Peel & Antioxidants Baliga M.S., et al. (2011). Phyllanthus emblica (Amla): A Review of Its Pharmacological Properties. Journal of Food Science and Nutrition.
 20. Ghasemi K., et al. (2009). Antioxidant Activity of Citrus Fruits (Orange Peel). Food Chemistry (Elsevier).
 21. F. Licorice & Skin Lightening / Anti-inflammatory Pastorino G., et al. (2018). Liquorice (Glycyrrhiza glabra): Phytochemistry and Pharmacological Activities. Phytotherapy Research (Wiley).
 22. G. General Herbal Cosmetic / Skin Science References Potluri A., et al. (2022). Review on Herbal Cosmetic Formulations. Research Journal of Topical and Cosmetic Sciences.
 23. Draelos Z.D. (2018). Cosmeceuticals and Cosmetic Practice. Elsevier.

HOW TO CITE: Kiran Makwana*, Krushal Sapariya, Dhara Siddhpuria, Rahul Shah, Shivam Singh, Abdul Basit, The Formulation and Evaluation of Poly Herbal Soap for Treatment of Acne and Its Associated Disorder, *Int. J. of Pharm. Sci.*, 2026, Vol 4, Issue 6, 7058-7068. <https://doi.org/10.5281/zenodo.20965704>

