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## Research Paper

# Formulation And Evaluation of Polyherbal Ayurvedic Face Wash for the Management of Acne Vulgaris

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## ABSTRACT

Herbal cosmetics are preparations used to enhance the human appearance. Herbal formulations have significant Demand in the global market. It is more acceptable to believe that natural remedies are safer than synthetic ones with fewer side effects. The current research work focuses on the extraction of neem leaves (*Azadirachta indica*), Turmeric (*Curcuma longa*), aloe Vera, glycerin, lemon juice, rose water and xanthan gum they have anti-acne, anti-inflammatory, and anti-oxidant properties, with the help of this herbal ingredient developed and evaluates as a herbal anti-Acne face wash. The face wash showed a multipurpose effect and all these herbal ingredients showed significant Different activities. The ingredient uses in herbal face wash have properties softening of skin, remove acne as well as Promote healing. The prepared formulation was evaluated based on number of criteria including consistency, pH test, spreadability, stability test, cleansing test, foamability and grittiness

## INTRODUCTION

The skin is the largest organ in the body, covering its entire external surface. The skin has 3 layers—the epidermis, dermis, and hypodermis, which have different anatomical structures and functions (see Image. Cross Section, Layers of the Skin) The skin's structure comprises an intricate network that serves as the body's initial barrier against pathogens, ultraviolet (UV) light, chemicals, and mechanical injury. This organ also regulates

temperature and the amount of water released into the environment.

Herbal cosmetics have gained significant popularity because of their therapeutic benefits, biocompatibility, affordability, and minimal side effects. Medicinal plants such as Neem (*Azadirachta indica*), Aloe vera (*Aloe barbadensis* Miller), and Turmeric (*Curcuma longa*) have been traditionally used in Ayurvedic medicine for the treatment of various skin disorders. Neem possesses potent antibacterial and anti-inflammatory properties, Aloe vera provides

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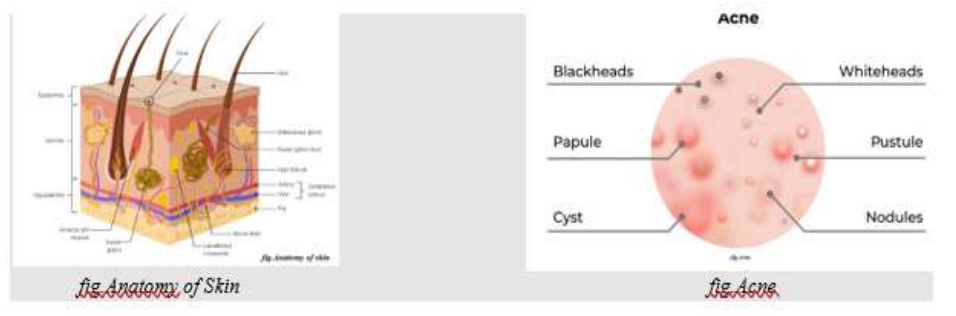
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moisturizing and wound-healing effects, while Turmeric exhibits strong antioxidant and antimicrobial activities. Additional ingredients such as honey, lemon juice, rose water, and peppermint oil contribute cleansing, soothing, moisturizing, and refreshing effects that support healthy skin. Polyherbal formulations combine the therapeutic benefits of multiple herbal ingredients to produce synergistic effects. Such formulations can effectively cleanse the skin, remove excess oil, reduce microbial growth, prevent acne formation, and promote skin regeneration. Herbal face wash

preparations are particularly advantageous because they provide daily cleansing while delivering active phytoconstituents directly to the skin. The present study focuses on the formulation and evaluation of a Polyherbal Ayurvedic Face Wash for the management of Acne Vulgaris. The study aims to develop a safe, effective, and economical herbal formulation using natural ingredients and to evaluate its physicochemical properties, stability, and suitability for acne-prone skin.



## 2. MATERIALS AND METHODS

### 2.1 MATERIALS

The materials used for the formulation of Polyherbal Ayurvedic Face Wash included Neem leaves (*Azadirachta indica*), Aloe vera gel (*Aloe barbadensis* Miller), Turmeric oil (*Curcuma*

*longa*), Honey, Lemon juice (*Citrus limon*), Rose water (*Rosa damascena*), and Peppermint oil (*Mentha piperita*). Xanthan gum was used as a thickening and stabilizing agent, Glycerin as a humectant and moisturizer, Sodium Lauryl Sulfate as a foaming agent, and Methyl Paraben as a preservative.

FLOW CHART: PLANT PROFILE AND CLASSIFICATION					
PLANT (Common Name)	BOTANICAL NAME	FAMILY	PLANT IMAGE	MAJOR CONSTITUENTS	USES
1. Neem	<i>Azadirachta indica</i>	Meliaceae		<ul style="list-style-type: none"> <li>Nimbin</li> <li>Nimbidin</li> <li>Quercetin</li> <li>Azadirachtin</li> </ul>	<ul style="list-style-type: none"> <li>Antibacterial</li> <li>Anti- acne</li> <li>Anti-inflammatory</li> <li>Antioxidant</li> </ul>
2. Aloe Vera	<i>Aloe barbadensis Miller</i>	Asphodelaceae		<ul style="list-style-type: none"> <li>Bartaloin</li> <li>Salicylic Acid</li> <li>Polysaccharides</li> <li>Vitamins</li> </ul>	<ul style="list-style-type: none"> <li>Moisturizing</li> <li>Wound Healing</li> <li>Soothing</li> <li>Anti-wrinkle</li> </ul>
3. Turmeric	<i>Curcuma longa</i>	Zingiberaceae		<ul style="list-style-type: none"> <li>Curcumin</li> <li>Curcuminoids</li> <li>Volatle Oils</li> <li>Timenone</li> </ul>	<ul style="list-style-type: none"> <li>Antioxidant</li> <li>Antimicrobial</li> <li>Anti-inflammatory</li> <li>Anti-acne</li> </ul>
4. Honey	<i>Apis mellifera</i>	Apidae		<ul style="list-style-type: none"> <li>Fructose</li> <li>Glucose</li> <li>Flavonoids</li> <li>Vitamins</li> <li>Enzymes</li> </ul>	<ul style="list-style-type: none"> <li>Moisturizer</li> <li>Antioxidant</li> <li>Wound Healing</li> <li>Nourishing</li> </ul>
5. Rose Water	<i>Rosa damascena</i>	Rosaceae		<ul style="list-style-type: none"> <li>Citronellal</li> <li>Geraniol</li> <li>Flavonoids</li> <li>Phenolic Compounds</li> </ul>	<ul style="list-style-type: none"> <li>Cooling</li> <li>Refreshing</li> <li>Anti-inflammatory</li> <li>Skin Tonic</li> </ul>
6. Lemon	<i>Citrus limon</i>	Rutaceae		<ul style="list-style-type: none"> <li>Vitamin C</li> <li>Citric Acid</li> <li>Limonene</li> <li>Flavonoids</li> </ul>	<ul style="list-style-type: none"> <li>Natural Cleanser</li> <li>Antioxidant</li> <li>pH Adjuster</li> <li>Astringent</li> </ul>
7. Peppermint	<i>Mentha piperita</i>	Lamiaceae		<ul style="list-style-type: none"> <li>Menthol</li> <li>Menthone</li> <li>1,8-Cineole</li> <li>Flavonoids</li> </ul>	<ul style="list-style-type: none"> <li>Cooling Agent</li> <li>Antimicrobial</li> <li>Fragrance</li> <li>Refreshing</li> </ul>

## 2.2 PREPARATION OF HERBAL EXTRACT

### Aloe Vera Gel:

Take some aloe Vera leaves and wash with distilled water .then dissect the outer part of edges of the leaves using a sterile knife. Then remove the jelly part i.e. aloe-vera gel is collected. Then collect the pulp and blend with the help of a blender.

### Extraction of Neem Leaves:

*Azadirachta indica* leaves were collected and washed under running tap water and rinsed with distilled water to remove dust and debris. The leaves were crushed In a mortar and pestle to a coarser particle size. The crushed leaves(50gm) added with 500ml of distilled water and boiled till the volume reduces to Half. Decoction was passed

through muslin cloth and allowed to cool down at room temperature. The prepared decoction was passed through muslin cloth and filtrate used for further research study.

## 2.3 PREPRATION OF HERBAL FACE WASH

- First add required quantity of Xanthan gum put in rose water for overnight in a beaker.
- In second beaker, aloe vera gel, glycerin, honey and few drops of lemon juice mix it.
- Transfer second beaker mixture (aloe vera gel + glycerin +honey +few drops of lemon juice) into to rose water mixture (Xanthan gum +Rose water)
- Mix the two, mixtures are together.
- Then add the Neem extract and Turmeric extract to above mixture, Mix it properly,

finally add sodium lauryl sulfate and Methyl Paraben to the above mixture. Mix it properly to make viscous Herbal Face wash.

oil is volatile and should be added at the end to preserve its aroma and properties.

- vi. Add a few drops of peppermint oil at this stage and mix gently but thoroughly. Peppermint

## 2.4 FORMULATION COMPOSITION

Name of Drug	F1	F2	F3
Neem Extract	4ml	4.5ml	3ml
Turmeric Oil	3 ml	2ml	2.5ml
Aloe vera gel	5gm	6gm	5gm
Honey	3ml	5ml	3ml
Lemon Oil	5 drops	6 drops	6 drops
Glycerine	5ml	5ml	4ml
Xanthan Gum	0.25gm	2gm	2gm
Rose Water	100ml	100ml	100ml
Methyl Paraben	0.02gm	0.02gm	0.02gm
Sodium Lauryl Sulphate	2gm	2gm	2gm
Peppermint Oil	0.2ml	0.2ml	0.2ml

## 2.5 EVALUATION PARAMETERS

The prepared Polyherbal Ayurvedic Face Wash formulations were evaluated using the following parameters:

### 1. Physical Appearance

The formulation was visually examined for color, odor, texture, consistency, and homogeneity. A good face wash should possess an attractive appearance, pleasant odor, and smooth texture without lumps.

### 2. pH Determination

The pH of the formulation was measured using a calibrated digital pH meter. The pH should be within the skin-friendly range (5.5–7.0) to avoid irritation and maintain normal skin physiology.

### 3. Washability

The face wash was applied to the skin and rinsed with water to evaluate the ease of removal. A good formulation should be easily washable without leaving any residue.

### 4. Foamability

Foamability was assessed by mixing the formulation with water and observing the amount and stability of foam produced. Adequate foam formation indicates good cleansing properties.

### 5. Grittiness Test

The formulation was rubbed between fingers to determine the presence of any coarse or gritty particles. The preparation should be free from grittiness to ensure smooth application.

### 6. Viscosity

Viscosity was determined using a Brookfield Viscometer. Appropriate viscosity is essential for easy application, spreadability, and product stability.

### 7. Spreadability

Spreadability was evaluated by measuring the ease with which the formulation spreads over the skin surface. Good spreadability ensures uniform application and consumer acceptability.

### 8. Cleansing Ability

The cleansing efficiency of the formulation was evaluated by assessing its ability to remove dirt, oil, and impurities from the skin surface.

### 9. Stability Study

The prepared formulations were subjected to stability testing under different temperature conditions. The formulations were observed for any changes in color, odor, pH, consistency, and phase separation during storage.

### 10. Skin Irritation Test

Test	Formulation F1	Formulation F2	Formulation F3
Color	Yellowish	Yellowish	Yellowish
Odor	Pleasant	Pleasant	Pleasant
Texture	Smooth	Smooth	Smooth
Spreadability	Easily Spreadable	Easily Spreadable	Easily Spreadable
Washability	Easily Washable	Easily Washable	Easily Washable
Foamability	2.4 ml	2 ml	3 ml
pH	6	7	6
Viscosity	1450	1560	1660
Grittiness	No Grittiness	No Grittiness	No Grittiness

The formulation was applied to a small area of skin and observed for redness, itching, burning sensation, or irritation. The absence of adverse reactions indicates the safety of the formulation for topical use.

## RESULTS

### *Evaluation of formulation*

## DISCUSSION

Among the three formulations, F3 demonstrated superior performance. The formulation showed excellent foamability (3 mL), indicating better cleansing efficiency compared to F1 and F2. The pH value of F3 was found to be 6, which is within the normal skin pH range and suitable for topical application without causing irritation. The viscosity of F3 (1660 cps) was higher than the other formulations, providing better consistency and ease of application.

## CONCLUSION

The Prepared formulations were evaluated for various physicochemical parameters, including appearance, pH, foamability, spreadability,

washability, viscosity, grittiness, and stability. All formulations showed satisfactory results; however, formulation F3 exhibited the best overall performance. F3 demonstrated excellent foamability, suitable pH, better viscosity, easy spreadability, good washability, and no signs of skin irritation.

By using Aloe Vera gel, Neem, turmeric, honey, peppermint oil and lemon juice the face wash showed a multipurpose effect and all these herbal ingredients showed significant different activities. Based on results and discussion, the formulation were stable at room temperature and can be safely used on the face. It is use to remove acne as well as promote healing, softening of skin .The extract of Azadirachta indica, Curcuma longa has anti-acne activity.

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