

Formulation And Evaluation of Poly Herbal Anti-Acne Cream

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Abstract— Acne is a common inflammatory skin disorder caused by excess sebum production, bacterial infection, and blockage of skin pores. Herbal medicines are widely used in cosmetic preparations due to fewer side effects and better skin compatibility. The present study was aimed to formulate and evaluate a poly herbal anti-acne cream using natural herbal ingredients such as Neem, Tulasi, Turmeric, Aloe vera, orange peel, Rosemary oil, Tea tree oil, Honey, Vitamin E. The cream was prepared by simple trituration and mixing method to obtain a smooth and homogeneous formulation suitable for topical application. The prepared cream was evaluated for organoleptic and physicochemical parameters including pH, homogeneity, spread ability, washability, irritancy, phase separation, and stability. The formulation showed good spread ability, smooth consistency, pleasant herbal odor, non-greasy nature, easy washability, and satisfactory stability during storage. The results confirmed that the formulated poly herbal anti-acne cream is safe, stable, and effective for topical application.

Index Terms— Anti-acne cream, Acne vulgaris, Herbal cosmetics, Neem, Tulsi, Aloe vera.

I. INTRODUCTION

Cosmetics are defined as product, preparation, or treatment applied to the skin for several function such as cleansing, moisturizing, protecting, enhancing and improves the appearance of the skin. Skin cosmetics are formulated in the form of solids, semi solids, and liquids. The study of cosmetics is called “Cosmetology”.

Skin is the largest and one of the most important organs of the human body, covering the entire external surface and protecting the internal organs from harmful environmental factors. It acts as a natural

barrier against microorganisms, dust, chemicals, ultraviolet (UV) radiation, and physical injuries. The skin is mainly composed of three layers is epidermis, dermis, and subcutaneous tissue. The different types of skin include normal skin, dry skin, oily skin, combination skin, and sensitive skin.

Acne is a chronic and inflammatory skin condition occurring due to the increased production of oil. The hair follicles are plugged with oil and dead skin cells. This causes white heads, blackheads, or pimples specifically on the face, shoulders, chest, neck, back, and upper arms. It affects all age groups though it commonly occurs among teenagers. This commonly occurs during puberty when the sebaceous glands become activate. Different types of acne include non-inflammatory acne and inflammatory acne.

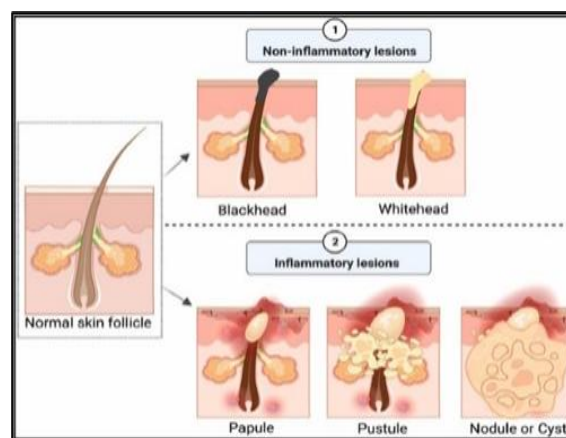


Fig.01: Types of Acne

A polyherbal anti-acne cream is a topical formulation containing a combination of two or more herbal ingredients designed to prevent and treat acne by reducing oil secretion, inhibiting microbial growth,

and decreasing inflammation, antibacterial, anti-inflammatory, antioxidant, antiseptic, and wound-healing properties. Commonly used herbal ingredients in anti-acne creams include neem, turmeric, aloe vera, tulsi, tea tree oil, orange peel, Rosemary oil. These herbs contain bioactive constituents such as flavonoids, alkaloids, tannins, terpenoids, and phenolic compounds which contribute to effective acne management. The herbal cream base provides proper consistency, spreadability, stability, and easy application on the skin. Poly herbal anti-acne creams are generally non-toxic, skin-friendly, economical, and suitable for long-term use. They also improve skin texture, maintain moisture balance, and help in reducing acne scars and pigmentation.

Benefits of Poly Herbal Anti-Acne Cream: -

- Helps in reducing acne and pimples.
- Possesses antibacterial activity against acne-causing bacteria.
- Prevents formation of blackheads and whiteheads.
- Helps in healing acne scars and dark spots.



Fig.02: Poly Herbal Anti-Acne Cream

Advantages of Poly Herbal Anti-Acne Cream: -

- Natural origin: Prepared from plant-based herbal ingredients, and safe for the skin.
- Fewer side effects: Produces less irritation compared to synthetic chemicals.
- Synergistic action: Combination of herbs enhances therapeutic effectiveness.
- Antibacterial property: Helps reduce acne-causing microorganisms.
- Anti-inflammatory effect: Reduces redness, swelling, and skin irritation.
- Sebum control: Controls excess oil production on skin.

Disadvantages

- Slower action: Takes longer time to show results compared to chemical treatments
- Variation in effectiveness: Results may vary due to natural ingredient variability.

II. INGREDIENTS PROFILE

<p style="text-align: center;">1.Neem Powder</p> <ul style="list-style-type: none"> ◆ Synonyms: - Azadirachta indica A. Juss, Arishta, ◆ Biological Source: - Neem consist of the fresh or dried leaves and seed oil of Azadirachta indica. <ul style="list-style-type: none"> ◆ Family: - Meliaceae ◆ Geographical Source: - India, Sri Lanka, Bangladesg. <ul style="list-style-type: none"> ◆ Chemical Constituents: -Nimbin, Nimbinene. ◆ Property: - Anti-inflammatory ◆ Uses: - Reduce the acne, Antibacterial action. 	<p style="text-align: center;">Fig. 03: Neem Powder</p>
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<p>2. Tulsi Powder</p> <ul style="list-style-type: none"> ◆ Synonyms: - Holy Basil, Indian Basil, Tulsi ◆ Biological Source: - Tulsi powder is obtained from the dried leaves of <i>Ocimum tenuiflorum</i>. <ul style="list-style-type: none"> ◆ Family: - Lamiaceae (Mint family) ◆ Geographical Source: - India, Nepal, Sri Lanka ◆ Chemical Constituents: - Eugenol, Linalool. <ul style="list-style-type: none"> ◆ Properties: - Antibacterial, Antifungal. ◆ Uses: - Reduce the acne and pimple treatment. 	 <p style="text-align: center;">Fig. 04: Tulsi Powder</p>
<p>3. Turmeric Powder</p> <ul style="list-style-type: none"> ◆ Synonyms: - Haldi, Indian Saffron Curcuma. ◆ Biological Source: - Turmeric powder is obtained from the dried rhizomes of <i>Curcuma longa</i>. <ul style="list-style-type: none"> ◆ Family: - Zingiberaceae. ◆ Geographical Source: - India, China. ◆ Chemical Constituents: - Curcumin, Curcuminoids. <ul style="list-style-type: none"> ◆ Properties: - Antibacterial, Antifungal. ◆ Uses: - Treat acne scars, Used in herbal cosmetics. 	 <p style="text-align: center;">Fig. 05: Turmeric Powder</p>
<p>4. Aloe Vera Gel</p> <ul style="list-style-type: none"> ◆ Synonyms: - Aloe vera, Ghritkumari. ◆ Biological Source: - Aloe vera gel is obtained from the fresh leaves of <i>Aloe barbadensis</i>. <ul style="list-style-type: none"> ◆ Family: - Asphodelaceae. ◆ Geographical Source: - India, Africa. ◆ Chemical Constituents: - Aloin, Enzymes. <ul style="list-style-type: none"> ◆ Properties: - Moisturizing, Emollient. ◆ Used: - Helps to reduce acne and pimple treatment. 	 <p style="text-align: center;">Fig. 06: Aloe Vera Gel</p>
<p>5. Orange Peel Powder</p> <ul style="list-style-type: none"> ◆ Synonyms: - Citrus Peel Powder. ◆ Biological Source: - Orange peel powder is obtained from the dried peels of <i>Citrus sinensis</i>. <ul style="list-style-type: none"> ◆ Family: - Rutaceae. ◆ Geographical Source: - India, Brazil, China. ◆ Chemical Constituents: - Cellulose, Vitamin C. <ul style="list-style-type: none"> ◆ Properties: - Antioxidant, Antibacterial. ◆ Uses: - Heal the acne, Helps remove excess oil from skin. 	 <p style="text-align: center;">Fig. 07: Orange Peel Powder</p>

<p>6. Rosemary Oil</p> <ul style="list-style-type: none"> ◆ Synonyms: - Rosemary Oil, Rosmarinus Oil. ◆ Biological Source: - Rosemary oil is obtained from the fresh flowering tops and leaves of <i>Rosmarinus officinalis</i> by steam distillation. <ul style="list-style-type: none"> ◆ Family: - Lamiaceae. ◆ Geographical Source: - India, Spain, France. ◆ Chemical Constituents: - Rosmanol, Cineole. <ul style="list-style-type: none"> ◆ Properties: - Antibacterial, Antifungal. ◆ Uses: - Prevent the skin pores. 	 <p>Fig. 08: Rosemary Oil</p>
<p>7. Tea tree Oil</p> <ul style="list-style-type: none"> ◆ Synonyms: - Melaleuca Oil ◆ Biological Source: - Tea tree oil is obtained from the fresh leaves and terminal branches of <i>Melaleuca alternifolia</i> by steam distillation. <ul style="list-style-type: none"> ◆ Family: - Myrtaceae ◆ Geographical Source: - Australia, India ◆ Chemical Constituents: - Terpinen-4-ol, Terpineol. <ul style="list-style-type: none"> ◆ Properties: -Anti-inflammatory, Antibacterial. ◆ Uses: Prevent irritation on skin. 	 <p>Fig. 09: Tea tree Oil</p>
<p>8. Honey</p> <ul style="list-style-type: none"> ◆ Synonyms: - Honey, Madhu. ◆ Biological Source: - Honey is a sweet substance produced by honey bees from the nectar of flowers. <ul style="list-style-type: none"> ◆ Family: - <i>Apis mellifera</i>. ◆ Geographical Source: - India, China, United States. <ul style="list-style-type: none"> ◆ Chemical Constituents: - Maltose, Glucose. ◆ Properties: -Antibacterial, Moisturizing property. <ul style="list-style-type: none"> ◆ Uses: - Improve the appearance of the skin. 	 <p>Fig. 10: Honey</p>
<p>9. Vitamin E Capsules</p> <ul style="list-style-type: none"> ◆ Synonyms: - Alpha-tocopherol. ◆ Biological Source: - RRR-Alpha tocopherol. <ul style="list-style-type: none"> ◆ Family: Tocopherol. ◆ Geographical Source: - India, China, Brazil, USA. <ul style="list-style-type: none"> ◆ Natural sources: - Soybean Oils, Sunflower. ◆ Chemical constituents: - Alpha beta gamma Deltatocopheral. <ul style="list-style-type: none"> ◆ Property: - Anti-oxidant. ◆ Uses: - It can heal the acne and scars. 	 <p>Fig. 11: Vitamin E Capsules</p>

III. FORMULATION TABLE

Sr.No.	Ingredients	Quantity Taken (25gm)	Uses
1.	Neem Powder	1.5 gm	Anti-inflammatory
2.	Tulsi Powder	1.5 gm	Anti-fungal
3.	Turmeric Powder	0.5 gm	Anti-inflammatory
4.	Orange Peel Powder	3 gm	Brighten up the skin, Anti-oxidant
5.	Aloe Vera Gel	7.5 gm	Emollient
6.	Rosemary Oil	1 ml	Anti-bacterial
7.	Tea Tree Oil	1 ml	Anti-acne lesions
8.	Vitamin-E Capsules	1 gm	Anti-oxidant
9.	Honey	1.5 gm	Anti-bacterial
10.	Triethanol Amine	0.5 ml	Emulsifier
11.	Distilled Water	Q.S. to 25 gm	Vehicle

IV. MATERIALS AND METHODS

♦ Plant Material

Neem, Tulasi, leaves were shade dried and made into fine powder. Aloe vera juice was collected from the fresh aloe, Turmeric powder, orange peel powder, Honey, Rosemary oil, Tea tree oil was purchased from the local herbal store.

♦ Solvents

Distilled water.

♦ Chemicals

Triethanol amine

♦ Apparatus:

Electronic weighing balance, Mechanical sieve haker, Mixer, Mortar and pestle, Beaker, Pipette, glass rod, filter.

V. METHODS OF PREPARATION

1. Collect fresh Neem and Tulsi leaves.
2. Shade dry the leaves for about 4 days.
3. Grind the dried leaves separately into fine powder using mixer or mortar and pestle.
4. Sieve the powders to obtain uniform particle size.

5. Extract fresh juice from Aloe vera leaves and filter it properly.

6. Collect all other ingredients such as Turmeric powder, orange peel powder, rosemary oil, tea tree oil, honey, vitamin-E capsules, and triethanolamine.

7. Take Neem powder and Tulsi powder in a mortar and pestle and triturate thoroughly.

8. Add orange peel powder and turmeric powder to the mixture and mix uniformly.

9. Gradually add Aloe vera juice while continuous stirring is carried out.

10. Add the contents of vitamin-E capsules and triethanolamine into the mixture.

11. Add tea tree oil drop by drop with continuous mixing.

12. Add rosemary oil slowly and stir properly to obtain uniform consistency.

13. Add honey to the formulation to achieve smooth texture and desired consistency of cream.

14. Make up the final volume using distilled water if required.

15. Mix the formulation thoroughly until a homogeneous cream is formed.

16. Transfer the prepared polyherbal anti-acne cream into suitable airtight containers for storage.

VI. OBSERVATION

- Smooth and homogeneous cream was obtained.
- Cream showed pleasant herbal odor and light greenish-yellow color.
- No phase separation or lumps were observed.
- Cream was non-greasy and easily spreadable
- Formulation showed good stability and washability.



Fig.12: Formulation Batch of Poly Herbal Anti-Acne Cream

VII. EVALUATION TEST

1. Organoleptic Test: -

Sr. No.	Parameter	Observation (Result)
1.	Color	Light Greenish Yellow Color Observed
2.	Odor	Pleasant Herbal Odor
3.	Appearance	Smooth and Elegant Appearance
4.	Texture	Soft and Smooth Texture

2. pH Determination Test: -

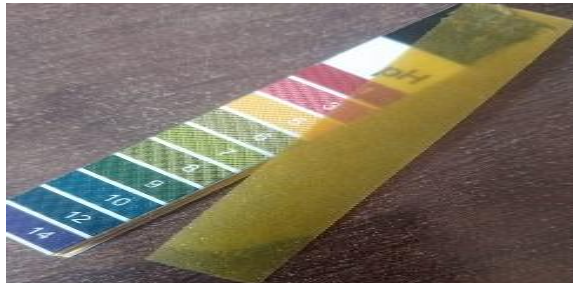


Fig.13: pH determination Test

➤ Result: - The pH of poly herbal anti-acne cream was found to be 6.5 – 7, which is suitable for skin application.

3. Homogeneity Test

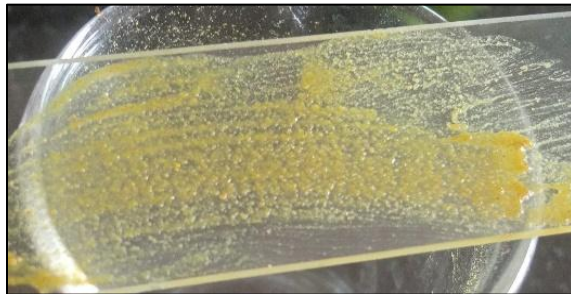


Fig.14: Homogeneity Test

➤ Result: - The formulated poly herbal anti-acne cream was found to be homogeneous with no lumps.

4. Spreadability Test



Fig.15: Spreadability Test

➤ Result: - The prepared Poly herbal anti- acne cream showed good spreadability (0.4 g cm/sec).

5. Washability Test

➤ Result: - The formulated poly herbal anti- acne cream showed good washability and was easily removed with water.

6. Irritancy Test



Fig.16: Irritancy Test

➤ Result: - No irritation, redness, or itching was observed on the skin during the irritancy study.

7. Stability Study Test

➤ Result: - The prepared cream remained stable with no change in color, odor, texture, or phase separation during storage.

8. Greasiness Test



Fig.17: Greasiness Test

➤ Result: - The formulation showed non-greasy nature with smooth application on the skin.

9. Phase Separation Test



Fig.18: Phase Separation Test

➤ Result: - No phase separation was observed in the prepared poly herbal anti-acne cream formulation.

VIII. RESULT

The formulated poly herbal anti-acne cream showed good spreadability, smooth texture, pleasant odor, non-greasy nature, easy washability, and good stability. The pH was found suitable for skin application (6–7). No irritation or phase separation was observed, indicating that the cream is safe and effective for acne treatment.

IX. CONCLUSION

The present study successfully formulated and evaluated a poly herbal anti-acne cream using natural herbal ingredients. The prepared formulation showed good anti-acne activity, antibacterial, anti-inflammatory, antioxidant, and soothing. The formulated cream showed smooth consistency, homogeneity, non-greasy nature, good spreadability, and satisfactory stability. The pH of the cream was found suitable for skin application, and no irritation or phase separation was observed during evaluation studies. Thus, the formulated poly herbal anti-acne cream can be considered safe, effective, stable, and economical for topical acne treatment with minimum side effects.

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