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Herbal Anti-Acne Creams: Polyherbal Formulation, Evaluation, and Therapeutic Potential - A Review

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Abstract: ***The present study aims to formulate and evaluate an herbal anti-acne cream for nourishing, moisturizing, and improving various skin problems. The cream was prepared using herbal ingredients such as Aloe vera, clove oil, rose oil, and tea tree oil. These ingredients were elected because of their useful therapeutic properties.Aloe vera has moisturizing, antibacterial, anti-inflammatory, and skin-soothing properties. It may help reduce acne, skin irritation, and acne scars. Tea tree oil and clove oil are known for their anti-acne, antibacterial, antioxidant, and anti-inflammatory properties. Rose oil may also help improve the overall condition and appearance of the skin.The use of herbal medicines has increased because some conventional treatments may cause unwanted side effects. Acne commonly develops due to excess sebum production, which can lead to blockage of skin pores and bacterial growth. Therefore, herbal ingredients may provide a natural approach to managing acne.The formulated cream was evaluated for different physical and pharmaceutical properties, including colour, odour, pH, homogeneity, grittiness, viscosity, spreadability, and skin irritation. The study focused on developing a safe, effective, non-toxic, and skin-friendly herbal anti-acne cream using natural ingredients.***

Keywords: Aloe Vera, tea tree oil, clove, rose oil, neem, turmeric, tulsi, peppermint, Anti-acne.

I. INTRODUCTION

A. Cosmetics

A cosmetic is any product used to clean, protect, maintain, improve, or change the appearance of the skin, hair, nails, or teeth. Cosmetics are commonly used to improve personal appearance and maintain hygiene.Common cosmetic products include make-up, perfumes, skin creams, nail polish, soaps, shampoos, shaving creams, and deodorants. The use of cosmetics has existed for thousands of years. Ancient civilizations, including the Egyptians and Sumerians, used various cosmetic products for beauty and personal care.The use and acceptance of cosmetics have changed over time. In some periods of Western history, cosmetics were not socially accepted. However, people continued to use them to improve their appearance. During the Middle Ages in Europe, for example, people used products to make the face look lighter and to add colour to the cheek.

B. Anti-Acne

Acne is a common skin condition characterized by red bumps, pimples, blackheads, and whiteheads, especially on the face. It occurs when oil (sebum), dead skin cells, and impurities block the hair follicles.Acne, also known as acne vulgaris, is a chronic inflammatory skin disorder. It commonly affects areas that contain a large number of oil glands, such as the face, upper chest, and back.Common symptoms of acne include blackheads, whiteheads, pimples, oily skin, redness, and sometimes permanent scars. Acne can also affect a person's emotional well-being. Severe or persistent acne may lead to low self-esteem, lack of confidence, anxiety, and emotional stress.

C. Cream

Creams are semi-solid preparations made from a combination of oil and water. They are commonly used for applying medicines or cosmetic ingredients to the skin.Creams are mainly classified into two types:Oil-in-Water (O/W) Cream: Small droplets of oil are dispersed in a continuous water phase.Water-in-Oil (W/O) Cream: Small droplets of water are dispersed in a continuous oil phase.Creams are widely used in cosmetic and pharmaceutical preparations because they are easy to apply, spread easily, and provide a smooth feel on the skin.

D. About Skin

The skin is the outer covering of the human body and is the largest organ of the body. It protects the muscles, bones, internal organs, and other tissues from external factors.

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The skin consists of several layers of tissue that provide protection and support. It covers almost the entire body and may contain hair. Based on hair distribution, skin can generally be described as hairy or hairless.The skin performs several important functions. It acts as a protective barrier against microorganisms, harmful substances, and excessive loss of water. It also helps in temperature regulation, sensation, insulation, and vitamin D synthesis.When the skin is severely damaged, the body attempts to repair it by forming scar tissue. Skin colour and pigmentation mainly depend on the amount and distribution of melanin.Human skin varies in colour and type among individuals. Skin types may range from dry to oily and may differ in their sensitivity and moisture levels.

II. TYPES OF SKIN

Skin is mainly classified into four types: dry, normal, oily, and combination skin.

1) Dry Skin: Dry skin has low moisture and feels tight, rough, and dry. It may look dull and dehydrated. Dry skin can become sensitive and may cause itching or irritation. Environmental conditions, genetics, aging, and lack of hydration can contribute to dryness.
2) Normal Skin: Normal skin is balanced, healthy, and smooth. It has a proper balance of moisture and sebum. The skin feels soft and elastic and usually has an even skin tone and small, normal-sized pores. It is less likely to develop excessive dryness or oiliness.
3) Oily Skin: Oily skin produces excess sebum (oil). It usually appears shiny, especially in the T-zone (forehead, nose, and chin). Excess oil can clog the pores and may lead to acne, blackheads, whiteheads, and enlarged pores. Proper cleansing and suitable skincare help control excess oil.
4) Combination Skin: Combination skin has characteristics of both oily and dry skin. The T-zone (forehead, nose, and chin) is usually oily, while the cheeks and sides of the face may be normal or dry. This skin type requires balanced skincare to manage both oiliness and dryness.
5) Sensitive skin : Sensitive skin is a type of skin that reacts easily to cosmetics,chemicals, and environmental factors. It may cause redness, itching, burning, and dryness.

Sensitive skin requires gentle skincare products to prevent irritation.



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Formulations Table

Ingredients	Activity
Teatree oil	Antimicrobial
Clove	Antimicrobial
AloeVera	Moisturizing
Neem	Anti-inflammatory
Turmeric	Anti-inflammatory
Tulsi	Antifungal
Peppermint	Antimicrobial
CetylAlcohol	OpacifierandEmulsifier
Roseoil	Soothing
Citricacid	ProtectiveAntioxidant
Glycerin	Humectant

III. HERBAL INGREDIENTS

1) Aloe vera



Figure 1. Aloe vera

Biological Source: Aloe vera gel is obtained from the fresh leaves of Aloe barbadensis Mill.
Chemical Constituents: Acemannan, aloin, aloe-emodin and polysaccharides.
Uses:
1)Moisturizes the skin.
2)Smoothness of skin irritation
3)Support wound healing .

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2) Clove



Biological Source: Clove oil is obtained from the flower buds of Syzygium aromaticum (L.) Merr. & L.M. Perry.
Chemical Constituents: Eugenol, eugenyl acetate and β-caryophyllene.
Uses:
1)Shows antimicrobial activity.
2)Helps reduce inflammation.
3)May help control acne-causing bacteria.

3) Tea tree oil



Biological Source: Tea tree oil is obtained from the leaves and terminal branches of Melaleuca alternifolia (Maiden & Betche) Cheel.
Chemical Constituents: Terpinen-4-ol, γ-terpinene and α-terpinene.
Uses:
1)Shows antimicrobial activity.
2)Helps reduce inflammation.
3)May help manage acne.

4) Rose oil



Figure 3. Rose oil

Biological Source: Rose oil is obtained from the fresh flowers of Rosa damascena Mill.
Chemical Constituents: Citronellol, geraniol, nerol and phenethyl alcohol.
Uses:
1)Provides fragrance to the cream.
2)Helps moisturize the skin.
3)Shows potential antioxidant activity.

5) Neem



Figure 5. Neem

Biological Source: Neem consists of the leaves of Azadirachta indica A. Juss.
Chemical Constituents:
1)Nimbin
2)Nimbolide
3)Azadirachtin
4)Gedunin
5)Quercetin
Uses:
1)Shows antimicrobial activity.
2)Helps reduce skin inflammation.
3)Traditionally used for skin problems.
4)May help control acne-associated bacteria.

6) Turmeric



Figure 6. Turmeric

Biological Source: Turmeric consists of the dried rhizomes of Curcuma longa L.
Chemical Constituents:
1)Curcumin
2)Demethoxycurcumin
3)Bisdemethoxycurcumin
4)Turmerones
Uses:
1)Shows anti-inflammatory activity.
2)Has antioxidant properties.
3)Shows antimicrobial activity.
4)May help reduce skin redness.

7) Tulsi



Figure 7. Tulsi

Biological Source: Tulsi consists of the leaves of Ocimum tenuiflorum L. (synonym: Ocimum sanctum L.).
Chemical Constituents:
1)Eugenol
2)Ursolic acid
3)Rosmarinic acid
4)Linalool
5)β-Caryophyllene
Uses:
1)Shows antimicrobial activity.
2)Has anti-inflammatory properties.
3)Shows antioxidant activity.
4)Traditionally used in skin care.

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8) Peppermint



Figure 8. Peppermint

Biological Source: Peppermint consists of the leaves and flowering tops of Mentha × piperita L.

Chemical Constituents:

1)Menthol
2)Menthyl acetate
3)1,8-Cineole
4)Limonene

Uses:

1)Produces a cooling sensation on the skin.
2)Shows antimicrobial activity.
3)May help soothe minor skin irritation.
4)Used in topical preparations.

IV. METHOD OF PREPARATION

1) Weighing of Ingredients: Accurately weigh all the ingredients required quantities to the using a suitable weighing balance.
2) Preparation of Oil Phase: place all oil-soluble ingredients, such as stearic acid, liquid paraffin, cetyl alcohol, and oils, in a clean beaker.
3) Preparation of Aqueous Phase: Take all water-soluble ingredients, such as distilled water, glycerin, and other suitable ingredients, in a separate beaker.
4) Heating of Both Phases: Heat both the oil phase and aqueous phase separately in a water bath at 70–80°C until all the ingredients dissolve properly.
5) Mixing of Both Phases: Slowly add the aqueous phase to the oil phase with continuous stirring to ensure proper mixing of the ingredients.
6) Formation of Cream: Continue stirring the mixture until a smooth, uniform, and homogeneous cream is formed.
7) Cooling: Allow the prepared cream to cool gradually to room temperature while stirring gently.
8) Addition of Heat-Sensitive Ingredients: Add heat-sensitive ingredients, if required, after cooling to a suitable temperature to prevent their degradation.
9) Packaging and Storage: Transfer the prepared cream into a clean, dry, suitable container and store it in appropriate conditions for further evaluation.

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V. EVALUATION OF HERBAL CREAM

The prepared herbal cream is evaluated by the following tests:

1) Physical Appearance – Check the cream for colour, odour, texture, homogeneity, and presence of lumps or particles.
2) pH – Measure the pH using a pH meter. The pH should be suitable for skin to avoid irritation.
3) Viscosity – Measures the thickness or flow property of the cream using a viscometer.
4) Spreadability – Determines how easily and uniformly the cream spreads on the skin.
5) Washability – Checks whether the cream can be easily removed from the skin with water.
6) Stability Test – The cream is stored under different conditions to check changes in colour, odour, pH, viscosity, and phase separation.
7) Skin Irritation Test – A small amount of cream is applied to the skin to check for redness, itching, swelling, or irritation.
8) Antimicrobial Activity – Determines the ability of the cream to inhibit or kill microorganisms, usually by measuring the zone of inhibition.

VI. ADVANTAGES OF HERBAL ANTI-ACNE CREAM

1) Fewer Side Effects: Generally causes fewer side effects.
2) Skin Friendly: Helps soothe and care for the skin.
3) Anti-Acne Effect: Helps reduce acne and pimples.
4) Anti-Inflammatory: Helps reduce skin inflammation.
5) Natural Ingredients: Contains plant-based ingredients.
6) Moisturizing: Helps keep the skin soft and hydrated.
7) Easy to Prepare: Can be prepared using simple methods.
8) Easy to Apply: Easy to apply and use on the skin.

VII. TREATMENT OF HERBAL ANTI-ACNE CREAM

1) Antibacterial action: Helps reduce acne-causing bacteria.
2) Anti-inflammatory action: Reduces redness and swelling.
3) Oil control: Helps control excess sebum production.
4) Prevents pimples: Helps reduce the formation of new pimples.
5) Soothing effect: Aloe Vera helps soothe irritated skin.
6) Skin healing: Helps support skin healing and reduce acne marks.

VIII. CONCLUSION

Nowadays, people are increasingly using natural and herbal products because they are considered safer. Herbal anti-acne cream contains herbal ingredients that may help reduce inflammation and prevent acne. The combination of herbal ingredients with oil- and water-based substances helps prepare a suitable cream for skin application. Thus, herbal anti-acne cream may be a useful natural approach for acne management.

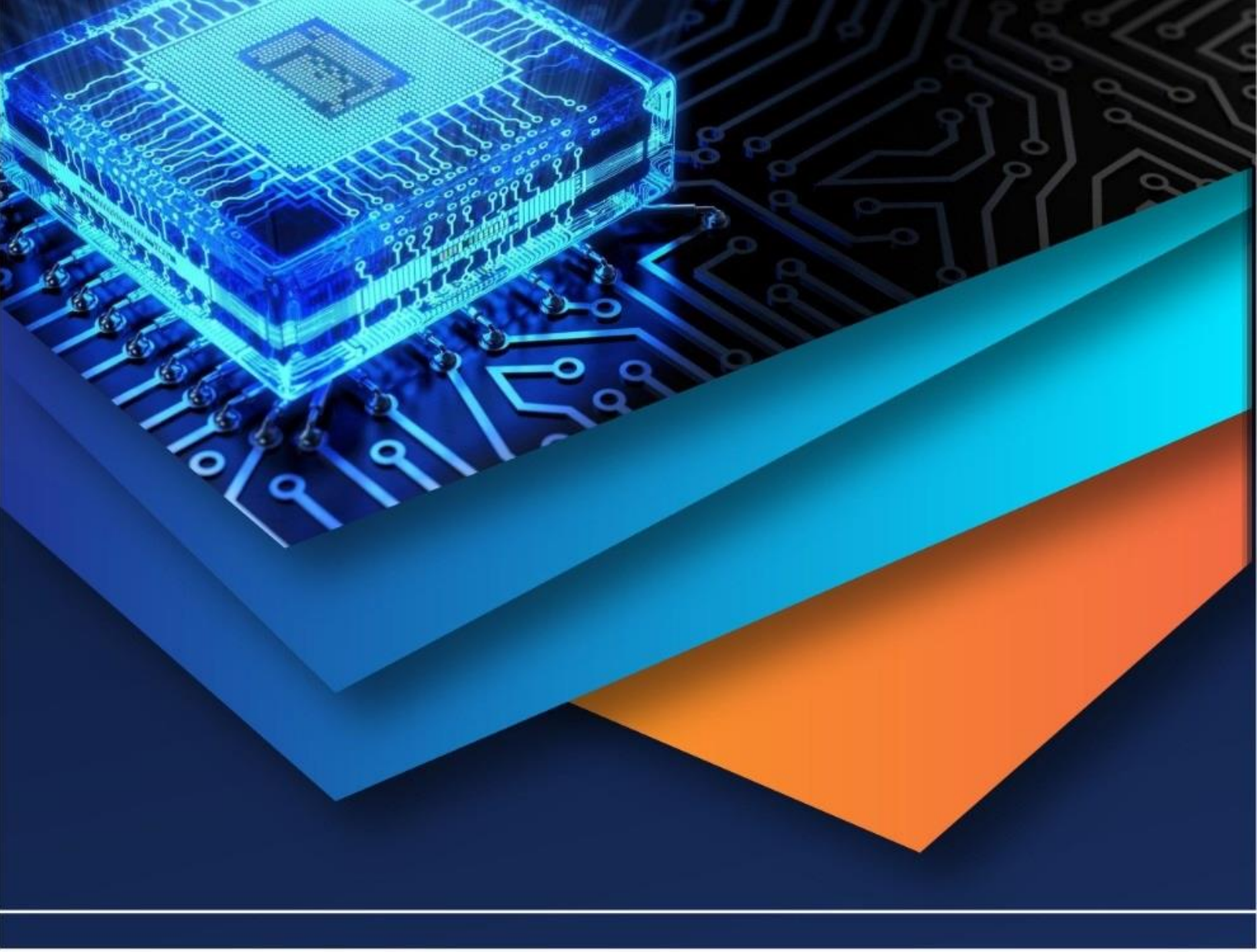
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