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A Review on Anti-Acne Cream

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Abstract: *Acne is a common skin issue that affects people of all ages and is often caused by bacterial infections and clogged pores. While there are many treatments available, the demand for natural and herbal remedies is growing due to their safety and fewer side effects.*
The formulation was prepared using the water-in-oil method to provide moisture and nourishment to the skin. Papaya fruit extract and Moringa leaf extract were the key ingredients in the cream.
The product was tested using different evaluation methods to check its quality. Throughout the study, the cream maintained good consistency, smooth spread ability, a neutral pH, and showed no signs of phase separation. Overall, the formulated cream proved to be stable and suitable for acne treatment.

Keywords: Acne Vulgaris, Propionibacterium acne, Carica papaya, Moringa oleifera, Skin, Polyherbal cream

I. INTRODUCTION

Cosmetics play an important role in daily life, not only for appearance but also for maintaining healthy skin. Among various skin problems, acne is the most widespread, especially during adolescence. It is mainly caused by excess sebum secretion, bacterial growth, clogged pores, and hormonal imbalance.

Chemical treatments for acne, such as benzoyl peroxide, antibiotics, and retinoids, are effective but often lead to side effects like skin dryness, irritation, or microbial resistance. Because of these challenges, natural products have gained attention as safer alternatives. Herbal extracts are considered beneficial due to their antimicrobial, antioxidant, and skin-healing properties.

This review explores the use of papaya fruit and moringa leaves in the formulation of an anti-acne cream. Both plants have been traditionally used for skin care and show promising activity against acne-causing factors.

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How Common is Acne?

Acne is one of the most common skin problems worldwide. It affects people of all ages but is especially frequent among teenagers and young adults. Studies show that about 80% of individuals between the ages of 11 and 30 experience acne at some point.

For girls, acne often starts around the ages of 14 to 17, while for boys it is most common between 16 and 19 years. Many people suffer from repeated flare-ups for several years before noticing gradual improvement as they get older. In most cases, acne tends to reduce or disappear by the time a person reaches their twenties.

Causes of Acne

Acne develops due to several skin-related changes, including:

Overactive sebaceous glands – excessive oil (sebum) production in the skin.

Hyperkeratosis – increased shedding and thickening of skin cells that block hair follicles.

Bacterial activity and inflammation also play an important role in worsening acne.

Symptoms of Acne

Acne can appear in different forms on the skin. The most common symptoms include:

Pimples (pustules): red bumps filled with pus.

Papules: small, raised red or dark bumps.

Blackheads: clogged pores with a black surface.

Whiteheads: clogged pores with a white surface.

Nodules: large, hard, and painful lumps under the skin.

Cysts: deep, pus-filled and painful lumps beneath the skin.

These different types of acne can vary in severity, from mild blackheads to painful cysts that may cause scarring if left untreated.

Acne and Its Management

Acne is a chronic skin condition caused by several factors:

Overproduction of sebum (oil) by sebaceous glands

Blockage of hair follicles

Bacterial infection (Propionibacterium acnes)

Inflammation triggered by the immune system

Conventional treatments such as topical creams, oral antibiotics, and retinoids are effective, but long-term use may cause irritation, resistance, or relapse after discontinuation. Therefore, herbal-based treatments are being considered as safer and more sustainable solutions.

Common Active Ingredients in Anti-Acne Creams

Benzoyl Peroxide

Function: Kills acne-causing bacteria and dries out pimples

Common Strengths: 2.5% to 10%

Side Effects: Dryness, peeling, redness

Salicylic Acid

Function: Helps unclog pores and exfoliates the skin

Great for: Blackheads and whiteheads

Side Effects: Mild irritation or stinging

Retinoids (e.g., adapalene, tretinoin)

Function: Promotes skin cell turnover and prevents clogged pores

Prescription or OTC? Both (adapalene is OTC, others need a prescription)

Side Effects: Peeling, sensitivity to sunlight

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Niacinamide (Vitamin B3)
Function: Reduces inflammation and redness
Bonus: Gentle on sensitive skin
Azelaic Acid
Function: Fights bacteria and helps with pigmentation
Often used for: Mild to moderate acne and dark spots
Sulfur
Function: Absorbs oil and unclogs pores
Smell: Can have a strong odor, but effective in spot treatments
Tea Tree Oil (natural)
Function: Antibacterial and anti-inflammatory
Good for: Mild acne and sensitive skin

Types of Anti-Acne Creams
Spot Treatments
Applied only to individual pimples
Usually stronger and fast-acting
All-Over Treatments
Applied to the entire acne-prone area
Helps prevent breakouts, not just treat them
Prescription Creams
Contain stronger ingredients (like tretinoin or clindamycin)
Must be prescribed by a doctor or dermatologist
Natural or Herbal Creams
Use plant-based ingredients (like aloe vera, tea tree oil)
Gentler, but may be slower or less effective for severe acne

Benefits of Using Anti-Acne Creams
Reduces size and number of pimples
Prevents new acne from forming
Improves skin texture and clarity
Can fade acne marks over time (depending on ingredients)
Convenient and easy to apply

Side Effects
Dryness or flaking
Redness or irritation
Peeling or burning sensation
Sun sensitivity (especially with retinoids)
Allergic reactions (rare, but possible)
To reduce side effects:
Start with a lower concentration
Apply every other day at first
Use a moisturizer and sunscreen

Tips for Using Anti-Acne Creams Effectively
Be consistent – Results take time, usually 4–8 weeks.
Use a gentle cleanser – Harsh soaps can make acne worse.

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Moisturize – Even oily or acne-prone skin needs moisture.
Avoid picking or popping pimples – It can cause scarring.
Don't mix too many active ingredients – This can irritate the skin.
Apply on clean, dry skin – Helps the cream absorb better.

Formulation of Anti-Acne Cream

The formulation of an herbal cream generally involves either a water-in-oil (W/O) or oil-in-water (O/W) emulsion. In this case, a water-in-oil base is often chosen because it helps lock in moisture and provides nourishment to the skin. Formulating an anti-acne cream means combining various ingredients in the right amounts to make a smooth, stable product that helps reduce or prevent acne without harming the skin.

1. Choosing the Base

The base is the cream's foundation. It determines how the cream feels on the skin, how well it spreads, and how the active ingredients are absorbed.
Oil-in-water (O/W) creams are light and easily absorbed—good for oily or acne-prone skin.
Water-in-oil (W/O) creams are heavier and more moisturizing—better for dry skin.
For acne-prone skin, a non-greasy, fast-absorbing O/W base is usually preferred.

2. Active Ingredients

These are the ingredients that directly help in treating acne:
Benzoyl Peroxide – kills acne-causing bacteria
Salicylic Acid – unclogs pores and exfoliates
Retinoids (like Adapalene) – helps skin shed dead cells faster
Niacinamide – reduces redness and oil
Azelaic Acid – antibacterial and helps fade acne scars
Natural extracts like tea tree oil or aloe vera can also be added for a gentle effect

3. Supporting Ingredients

These help with the texture, stability, and feel of the cream:
Emulsifiers – help mix oil and water (e.g., cetostearyl alcohol)
Humectants – keep skin hydrated (e.g., glycerin, propylene glycol)
Preservatives – prevent bacterial or fungal growth (e.g., parabens or phenoxyethanol)
Thickeners – adjust the consistency (e.g., carbomer)

4. Preparation Method

Here's a simple outline of how an anti-acne cream is usually prepared:
Phase I – Oil Phase: Oil-soluble ingredients (like emulsifiers and oils) are heated together.
Phase II – Water Phase: Water-soluble ingredients (like humectants and water) are heated separately.
Mixing: The two phases are mixed together while warm and stirred continuously to form a uniform cream.
Cooling & Adding Actives: Once the cream cools down, sensitive active ingredients are added.
Final Mixing: The cream is mixed until smooth and then packed into containers.

Evaluation of Anti-Acne Cream

Once the cream is made, it needs to be tested to make sure it is effective, safe to use, and has a good shelf life.

1. Physical Appearance

Check the cream for color, texture, and smoothness.
There should be no lumps, separation, or bad odor.

2. pH Testing

The pH should be close to the skin's natural pH (around 5.5).

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This ensures the cream won't irritate the skin.

3. Spreadability

A good cream should spread easily on the skin without being too greasy or sticky.

Spreadability can be tested by measuring how far the cream spreads under a standard weight.

4. Stability Testing

The cream is stored at different temperatures for weeks or months to check for changes in texture, color, or effectiveness.

This ensures the product won't spoil or lose its effect over time.

5. Skin Irritation Test

Usually done on a small patch of skin (either in animal studies or human volunteers).

The cream should not cause itching, redness, or burning.

6. Antibacterial Activity

If the cream contains ingredients meant to kill bacteria (like benzoyl peroxide), it can be tested in a lab to see how well it stops bacterial growth—especially *Cutibacterium acnes*, the bacteria linked to acne.

7. User Trials (Optional but Useful)

Small groups of people can try the cream for a few weeks and report how well it worked.

Feedback can include reduction in pimples, ease of use, and whether it caused dryness or irritation.

Comparative Perspective

Other herbal ingredients such as neem, turmeric, and aloe vera are widely studied for acne. However, papaya and moringa offer unique benefits:

Papaya acts as a natural exfoliant and brightener.

Moringa offers superior antibacterial and anti-inflammatory activity.

The combination provides a broader range of benefits than many single-herb formulations.

Challenges and Future Perspectives

While herbal formulations show promise, some challenges remain:

Lack of standardization in extract preparation

Limited clinical trials to confirm effectiveness on a large scale

Stability and shelf-life concerns of natural products

Future research should focus on optimizing formulations, conducting clinical trials, and comparing herbal creams with synthetic options to establish their place in modern dermatology.

II. CONCLUSION

Acne is a common problem that requires safe and effective treatment. Natural ingredients provide multiple benefits, including antimicrobial, antioxidant, and anti-inflammatory effects. When combined in a cream formulation, they have the potential to fight acne while nourishing and hydrating the skin. With further research and development, papaya and moringa-based anti-acne creams could become a reliable alternative to conventional treatments.

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