

Formulation and Evaluation of Herbal Anti-Acne Cream -A Review

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ABSTRACT

Acne vulgaris is a common disease that is mostly found on the face, neck, chest, upper back and shoulder. Most people will have acne to a degree during puberty. Approximately 15 to 30 out of 100 adolescents have moderate to severe acne. Acne may lead to scarring, particularly if it is severe. Scars sometimes form when wounds heal. Acne-caused wounds are in deeper layers. *Propionibacterium acnes* and *Staphylococcus epidermidis* are recognized as pus-forming bacteria and these cause inflammation in acne. Herbal medications are safer than allopathic medicines because, herbal medicines have no side effects like scaling, itching, redness, skin peeling, etc. Acne is treated with a variety of anti-bacterial agents. The anti-acne cream is prepared by using the method of oil phase and liquid phase. In herbal creams, the leaves extracts of Wild mint, Green amaranth, Neem, Tulsi, the flowers extracts of Night jasmine, Clove, the fruit extracts of Red jambu, Amla, the seeds extracts of Methi, Coriander and many other herbal ingredients are used. There were several criteria used to evaluate the cream formulations, including tests for microbiological growth, physical evaluation, greasiness, determination of pH, removal, homogeneity, grittiness, spreadability, viscosity, after feel, washability, non irritancy test, dilution test, stability and drug content.

Keywords: Acne vulgaris, *Propionibacterium acnes*, *Staphylococcus epidermidis*, Herbal medications, Herbal anti-acne cream.

INTRODUCTION

Acne vulgaris is a very frequent skin condition that can present with inflammatory and non-inflammatory lesions. The word acne comes from "acme" which stands for "prime of life". Vulgar acne is triggered by *Propionibacterium acne* during adolescence, under the influence of dehydroepiandrosterone in normal circulation. About 20% of the affected people develop severe acne, resulting in scarring (1). One of the most prevalent dermatological illnesses in the world, acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit that affects an estimated 650 million people globally (2). Acne causes severe morbidity, including persistent scarring and psychological issues like low self-esteem, sadness, and anxiety, all of which have a detrimental effect on quality of life (3). Acne comes in a variety of forms, including acne vulgaris, acne rosacea, acne cosmetica, acne fulminans and acne mechanica. Acne can be categorized into four groups on the basis of the lesion type: non-inflammatory (just comedone acne), mild papular, scarring papular and nodular (4). The development of facial acne vulgaris lesions may cause anxiety and lower self-esteem, which will lower quality of life (5). Additionally, patients with acne may also experience other symptoms like scarring, erythema, and hyper pigmentation (6).

For treating acne many skin creams are used. The purpose of a skin cream is to protect the skin from various environmental factors, including weather and to provide calming effects. There are wide varieties of creams, including hand, body, cleansing, cold, foundation, disappearing, night and massage creams, anti-acne cream, anti-aging cream, baby cream, anti-oxidant cream (7). Among these anti-acne formulations are used to treat acne vulgaris (8). There are numerous synthetic skin formulations on the market, however they all have certain drawbacks or negative effects. The most effective and readily available treatment for any skin condition is a herbal formulation. In addition to being used to treat skin disorders, the anti-bacterial, anti-acne, anti-aging, anti-oxidant, and anti-inflammatory properties in acne cream formulations are also utilised to promote skin beauty (9). Synthetic acne creams are made up of chemicals. Sulphates, parabens, phthalates, triclosan, foemaldehyde, PEG, alcohol, etc are used in cosmetics based on their functions but these may cause cancer, respiratory disorders, irritation to eye and skin and it can affect human central nervous system (10). To overcome all these problems herbal creams are used (11). A herbal cream has multiple benefits, such as bringing glow to the face, moisturising, reducing acne and

skin irritation, and treating skin conditions like eczema, psoriasis, dry skin, wrinkles, and rashes (7). It is quite nutritious and contains a lot of vitamins and minerals, it increases the body's amount of energy, it boosts immunological function without upsetting the body's delicate equilibrium (12).

The herbs used in the herbal anti-acne cream was shown in the following table 1.

Table:1 Herbs Used In The Herbal Anti-Acne Cream (13,7,14,8,15,16,17,18,19,20,21,22,11,23)

S. NO	PLANTS	COMMON NAME	FAMILY	PARTS	USES
1	<i>Azadirachta indica</i>	Neem	Meliaceae	Leaves	Antibacterial
2	<i>Ocimum tenuiflorum</i>	Tulsi	Lamiaceae	Leaves	Antibacterial, adds glow to the face
3	<i>Lantana camara</i>	Lantana or Shrub verbana	Verbana	Leaves	Anti-inflammatory activity
4	<i>Morus alba</i>	Mulberry	Moraceae	Leaves	Antibacterial activity
5	<i>Luffa actangula</i>	Ridged Gourd	Cucurbitaceae	Leaves	Anti-inflammatory
6	<i>Amaranthus spinosus</i>	Spiny amaranth	Amaranthaceae	Leaves	Antioxidant
7	<i>Cestrum nocturnum</i>	Night-blooming jasmine	Solanaceae	Leaves	Anti-inflammatory
8	<i>Garcinia mangostana</i>	mangosteen	Guttiferae	Peel	Anti-aging
9	<i>Ocimum basilicum</i>	Sweet Basil	Lamiaceae or Labiatae	Leaves	Cleanser & moisterizer
10	<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Leaves	Collagen promoting agent
11	<i>Emblica officinalis Gaertn</i>	Indian gooseberry or amla	Phyllanthaceae	Fruits	Anti-inflammatory
12	<i>Eugenia caryophyllus</i>	Clove	Myrtaceae	Flower buds	Pain-relieving activity
13	<i>Zingiber officinale</i>	Ginger	Zingiberaceae	Rhizomes	Anti-inflammatory
14	<i>Trigonella foenum graecum L</i>	Methi	Fabaceae	Seed	Remove pimples and blackheads
15	<i>Murraya Koenigii</i>	Curry leaf	Rutaceae	Leaves	Wound healing activity
16	<i>Cajanus cajan</i>	Pigeon pea	Fabaceae	Leaves	Wound healing activity
17	<i>Urtica dioica</i>	Stinging Nettle	Urticaceae	Leaves	Anti-bacterial activity
18	<i>Amaranthus viridis</i>	Green amaranth	Amaranthaceae	Leaves	Anti-bacterial activity
19	<i>Syzygium samarangense</i>	Red jambu	Myrtaceae	Fruits	Antibiotic action
20	<i>Aloe barbadensis miller</i>	Aloe vera	Liliaceae	Gel	Maintaining moisture
21	<i>Daucus Carota</i>	Carrot	Apiaceae	Root	Anti-aging properties
22	<i>Mangifera indica</i>	Mango	Anacardiaceae	Leaves	Antibiotic properties
23	<i>Coriandrum sativum</i>	Coriander	Apiaceae	Seeds	Antibacterial activity
24	<i>Mentha arvensis</i>	Wild mint	Lamiaceae	Leaves	Cooling and soothing agent
25	<i>Boswellia serrata Roxb</i>	Indian olibanum	Burseraceae	Gum	Anti-acne activity.
26	<i>Cymbopogon</i>	Lemon grass	Poaceae	Leaves	Anti-bacterial activity

FORMULATION OF HERBAL ANTI-ACNE CREAM

The cream is formulated by combination of oil phase & aqueous phase. Stearic acid, cetyl alcohol, potassium hydroxide, and sodium carbonate were combined in one porcelain dish and melted at 70°C to create the oil phase. Extract of the crude compounds, glycerine and triethanolamine were added to another porcelain dish and heated at 70°C to prepare the aqueous phase. Later the aqueous phase is mixed with oil phase and mixed to form a smooth cream (24)(20)(25)(21).

EVALUATION OF ANTI-ACNE HERBAL CREAM

Evaluation of anti-acne herbal cream is based on two parameters. They are physical test (greasiness, determination of pH, removal, homogeneity, grittiness, spreadability, viscosity, after feel, washability, dilution test and stability) and pharmacological test (non-irritancy test, tests for microbiological growth, drug content and anti-oxidant)

Physical Evaluation

The cream's colour, odour, texture, and condition are assessed (7).

Greasiness

Smears of a cream were applied to the skin's surface, and they were examined to determine whether they were oily or grease-like (7).

Grittiness

Compound microscope is used to examine the formulation in order to check for the existence of any particles (26).

Viscosity

Using viscometer, viscosity of the formulation is determined (27).

Determination of Ph

By calibrating the pH metre with buffer solution, 2.5g of cream is dissolved in 100ml of ethanol, and its pH is determined (28).

After Feel

After application, the smoothness and emollient nature are assessed (21).

Wash ability

After applying the formula to the skin, the efficiency of water washing was evaluated (13).

Stability

Anti-acne cream is kept at three different temperatures for two months: 8°C, 27°C, and 40°C. This was done as part of the stability study (23).

Spreadability

500mg of cream was sandwiched between two slides. On the upper slide, place a 100 g weight. Extra formulation was scraped off and weight was reduced. The apparatus's board serves as the bottom slide's mounting point, and the upper slide is fastened with stiff string to which a 20 g load is imparted. It is observed how long the upper slide took to slip off (24).

Homogeneity

The uniformity of the formulations was evaluated through touch and visual appearance (29).

Dilution Test

It verifies that the manufactured cream is an emulsion cream of the O/W type (30).

Pharmacological Evaluation

Tests For Microbiological Growth

The formulated herbal cream and the control, which didn't contain the formulated cream, were inoculated in agar media plates to determine whether any microbial growth occurred in the prepared herbal cream using the streak plate method. The plates were then checked and put side by side with the control to see if any microbial growth had occurred (26).

Non-Irritancy Test

On the back of the left hand, apply the prepared cream. The duration and area of the cream application are then taken into account. Within 24 hours of using a cream, rashes, eczema, and irritation on the applied region are visible (21).

Drug Content

1gm of gel in a 10 ml volumetric flask is diluted with methanol and the amount of drug was ascertained. 1 ml of 2% $AlCl_3$ is combined with 3 ml of stock solution. The mixture was vortexed for 15 seconds before being left to stand for 30 minutes at 40°C to develop the colour. In order to measure the absorbance, a spectrophotometer was used at 420 nm (8).

Anti-Oxidant Activity

The reducing power assay was used to determine the *in vitro* anti-oxidant activity. The standard utilised was ascorbic acid. The following formula was used to compute the percentage of reduction:

% of reduction power is equal to $[1 - (1 - A_s/A_c)] \times 100$.

Where A_s is the sample's absorbance and A_c is the standard's absorbance at the highest concentration tested (31).

CONCLUSION

Acne vulgaris is a most common skin condition which occur during the adolescence. This will result in permanent scar on the individual. Which may cause sadness, anxiety and lowering the self esteem in the adult. The herbal antiacne creams are the best alternative over the synthetic creams as they are very safe to use and they will not cause any other side effects. Number of herbs can be used for the preparation of herbal antiacne creams. Mostly the cream is prepared by oil in water phase. After preparation, they are evaluated for their physical & pharmacological properties and marketed.

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