Formulation and Evaluation of Herbal Antiacne Facewash

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Abstract: **Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal formulations have growingdemand in theworld market. The present work deals with the development & evaluation of the herbal anti-acne face wash containing aqueous extract of Neem leaves (Azadirachtaindica), turmeric (Curcuma longa),Agar (agar-agar,Red,red-algae), Reetha (Sapindusmukorossi), Aloe-vera (Kumari), Multanimitti (fuller earth) Etc.Although various topical herbal formulations for acne are available in the market, we propose to make pure herbal formulation without using any synthetic ingredient.**

Keywords: **Types of skin, Acne, Synthetic Cosmetics, Aloevera, Neem, Antibacterial.**

INTRODUCTION

Acne is a skin disorder (follicular unit) that experiences almost everyone in life at a certain point.The prevalence of acne increases in adolescence, but affects many men and women between the ages of 20 and 30. There are five types of acne: comedogen, pustules, cystic, nodular, and nodular. Whitehead and Acne are two variations: non-inflammatoryComedonal Acne, Blackheads like open pores.It shows dark skin reciprocity of melanin, sebum, and hair follicle cells, but the whitehead looks like a cool or white lump. The nipples are smaller than 5 mm in diameter and often appear to be red, solid, and increased lesions. The skin height of the localizedprotective material is called pustules.

1. Nodules and cysts increase, and solid lesions affect the subcutaneous fabric and deeper dermis. The nodule is more than 5 mm in diameter,butthe cyst is one less diameter. Many physiological elements such as excessive follicular contraction have increased biogenesis due to increased androgen and biological systems.
2. Virtual ideas such as target cells, biomarkers, neuroendocrine, genetic and environmental factors, variations in sensitivity to pathogenesis must be improved. Vulgaris, which contains both plant and artificial substances, has a prominent healing effect on a variety of acnes.
3. They can have different mechanism like:
   a. Control sebum secretion.
   b. Antibiotics which inhibits Propionoibacterium acne & Staphylococcus epidermidis, the main causative organism of acne.
   c. Keratolytic which removes the keratin layer & prevents the trapping of sebum under the skin.
   d. Anti-inflammatory which prevents the worsening of condition due to inflammation or redness etc.

Numbers of formulations are available in the market with variety of active pharmaceutical ingredients for the treatment of acne. Topical formulations, available in the market are as follows: Gel, Cream, Lotion, Face wash or cleanser, Face pack or mask. Neem (Azadirachtaindica, Meliaceae), turmeric (Curcuma longa) & nutmeg (Myristicafragrance, Myristicaceae)are reported to have very beneficial effect on acne due to anti-microbial, anti-inflammatory & anti-oxidant activities of different chemical constituents.

ACNE

ANATOMY OF SKIN

In terms of weight and surface, the skin is the largest organ in the body. The surface is approximately 16,000 cm2. The skin is 8% of the adult body weight. It isthe largest layer or tissue of a living organism.The skin acts as a protection against the outdoor environment. In sunlight, the skin can create advantageous chemical connections known as vitamin D. The skin functions as a sensory organ and helps to control the body's temperature. The skin contains a variety of biological components, including keratinocytes, melanocytes, and red blood cells. Many components such as cells and fibers create a multilayered structure. The skin is made up of 3 layers.

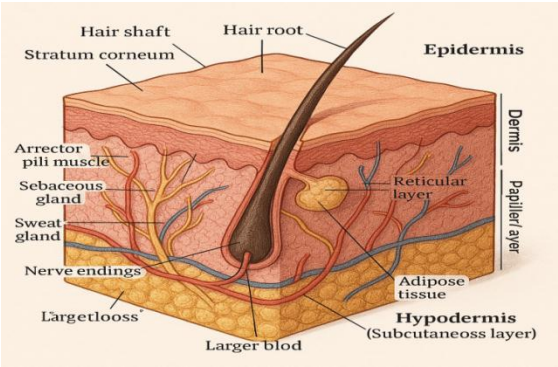
A) Epidermis
B) Dermis
C) Hypodermis

A) Epidermis (Outer Layer):The epidermis is the outermost layer of the skin, acting as a protective barrier against external elements like bacteria, UV rays, and pollutants. It is mainly composed of keratinocytes, which produce keratin, and also contains dead skin cells on the surface. These dead cells naturally shed, but if they accumulate, they can clog pores especially when mixed with oil—leading to blackheads and whiteheads. This layer plays a key role in the early stages of acne formation.It is classified into five subsidiaries, which are:

1) stratumcorneum
2) layerlucidium
3) granulosa layer
4) stratummyoma
5) layer basal

B) Dermis: The dermis is the middle and thicker layer of the skin. It contains sebaceous glands, hair follicles, sweat glands, blood vessels, and nerve endings. The sebaceous glands produce sebum, which keeps the skin moisturized. However, overproduction of sebum can clog pores and encourage the growth of acne-causing bacteria like Cutibacterium acnes. This leads to inflammation, making the dermis the main site of pimple development.

C) Hypodermis: The hypodermis, or subcutaneous layer, is the deepest part of the skin. It is made up of fat cells and connective tissue, which help insulate the body and cushion internal organs. While it does not directly cause acne, it supports the upper skin layers and aids in overall skin health and healing.



Layers of skin

HERBAL FACE WASH

A facial cleanser is a facial care product used to clean the skin on the face of make-up, dead skin cells, oil, grime, and other sorts of pollution. It aids in pore cleaning and the prevention of skin conditions like acne. Together with a toner and moisturizer, a face cleanser can be used as part of a skincare routine.

BENEFITS OF HERBAL FACE WASH

- Gentle on the skin
- Contains natural ingredients like neem, aloe vera, and tulsi
- Maintains the skin’s natural moisture balance
- Deeply cleanses without drying the skin
- Helps prevent acne and breakouts
- Suitable for all skin types
- Eco-friendly and cruelty-free

DISADVANTAGE OF HERBAL FACE WASH

- May not be as effective for severe acne or skin conditions
- Results can take longer to show compared to chemical-based products
- Some natural ingredients may still cause allergic reactions or irritation
- Shelf life is usually shorter due to fewer preservatives
- Quality and effectiveness can vary between brands
- May be more expensive than regular face washes
- Scent or texture may not appeal to everyone

PROPERTIES OF HERBAL FACE WASH

- Made with 100% natural and safe herbal ingredients

- Free from harmful chemicals, parabens, sulfates, and synthetic fragrances
- Gentle and non-irritating on all skin types
- Maintains the skin's natural pH balance
- Effectively removes dirt, oil, and impurities
- Helps control acne and breakouts

Advantages of Herbal Cosmetics over Synthetic Cosmetics:

These remedies are gaining popularity because most women these days prefer natural products over chemical products for their personal care to enhance their beauty because these products are the bodynourishes, improves health and provides satisfaction. These are free synthetic chemicals and have relatively fewside-effects compared to the synthetic cosmetics.

ADVANTAGES OF HERBAL COSMETICS

A.Suitable for all Skin Types	Natural Cosmetics is suitable for all skin types. Whether you have a dark or light complexion, you will find natural cosmetics such as foundation, eye shadow, and lipstick adapted to your complexion. Coal tar is a known human carcinogen and the biggest problem with individual colors of coal tar (whether coal tar or synthetic) is carcinogenicity. But the natural colors of herbs are safer.
B.Wide 6 Selection	There is a wide variety of plant extracts such as a Andrographispaniculata , Asparagus racemosus , Boswelliaserrata ,Bitumen
C.Nottested on Animals	AndrographisPaniculata (Kalmegh), However, natural cosmetics do not to be tested on animals.
D.No side effects	With natural cosmetics, you don't have to worry about it. The natural ingredients used guarantee the absence of side effects, it can be applied anytime and anywhere. And is suspected of interfering with hormonal function. Clears mild to moderately severe acne. Isotretinoin(Accutane) is an oral medication on used only to treat very severe and disfiguring acne.

Advantages of herbal cosmetics

CATEGORIES OF AGENT USED IN HERBAL FACE WASH

1. Antimicrobial agents-

Generally speaking, an antimicrobial is an agent that interferes with the growth and reproduction of bacteria. While antibiotics and antimicrobial attack bacteria, the terms have evolved over the years to have two different meanings. Antimicrobials are now most often described as agents used to disinfect surfaces and eliminate potentially harmful bacteria.

2.Antiacne agents-

Antiacnemedication are used for different purposes depending on these verity of then condition.

USES OF HERBAL FACE WASH

- Cleanses the skin by removing dirt, oil, and impurities
- Helps prevent acne, blackheads, and whiteheads
- Controls excess oil production
- Refreshes and rejuvenates the skin
- Soothes irritated or sensitive skin
- Maintains skin hydration and prevents dryness
- Helps reduce inflammation and redness
- Prepares skin for better absorption of moisturizers and serums.

Ingredients used in formulation

SR.No	Ingredient	Uses	Image
1	Botanical Name: *Aloe vera* (L.) Burm.f. Family: Asphodelaceae (formerly classified under Liliaceae)	Natural Antibacterial Agent Reduces Inflammation, Redness, And Swelling Of Pimples	
2	Botanical Name: *Curcuma longa* L. Family: Zingiberaceae	Reduces acne and prevents future breakouts Helps cleanse skin prevent infection	

3	Botanical Name: *Mentha piperita* L. Family: Lamiaceae (Mint family)	Provides a refreshing, soothing sensation to the skin Contains menthol which helps reduce acne and breakouts	
4	Glycerin (also known as Glycerol) Chemical Formula: $C_3H_8O_3$	Attract moisture to keep skin hydrated Make skin smooth, soft, and supple Improve texture and spreadability of facewash	
5	Botanical Name: *Azadirachta indica* A. Juss. Family: Meliaceae	Controls excess sebum production. Reduce inflammation associated with pimples and acne lesions Speeds up healing of the skin Unclogs the pores and prevent formation of blackheads and whiteheads	
6	Botanical Name: *Rosa damascena* Mill. (commonly) or *Rosa centifolia* L. Family: Rosaceae	Helps tighten pores and maintain skin's pH balance Provides moisture to the skin without making it oily	

METHODS AND MATERIALS

SR. NO.	INGREDIENTS	Quantity			USES
		F1	F2	F3	
1.	AloeVera	10gm	15gm	20gm	Hydratingagent,Anti-wrinkles
2.	Turmeric Powder	1gm	1.5gm	2gm	Antimicrobial agent, Anti-inflammatory, Antioxidant
3.	PeppermintOil	1ml	1.5ml	2.0ml	Antibacterial
4.	Neem	5g	7.5g	10g	Antiseptic
5.	Glycerin	5ml	7.5ml	10ml	Humectants
6.	MultaniMitti	8gm	12gm	16gm	Oil absorber and detoxifier
7.	Gram Flour	5gm	7.5gm	10gm	Exfoliant
8.	Reetha Powder	10gm	15gm	20gm	Natural Cleanser
9.	Sodium Benzoate	0.5gm	0.75gm	1gm	Preservative
10.	Agar	0.5gm	0.75gm	1gm	Natural Thickner
11.	Rose Water	155ml	125ml	108ml	Base

Formulation of herbal face wash

METHOD OF PREPARATION

STEP 1)

To prepare the herbal anti-acne face wash, begin by adding distilled water to a clean beaker. Gradually sprinkle in agar powder while stirring, and gently heat the mixture until the agar fully dissolves. Allow it to cool slightly until it forms a gel-like

consistency. In a separate container, prepare a Reetha extract by mixing Reetha powder with warm water and allowing it to steep. After sufficient time, strain the mixture to remove any solids and add the clear extract to the prepared agar base, stirring well to combine.

STEP 2)

Next, prepare a smooth paste by mixing MultaniMitti, gram flour, turmeric powder, and neem powder or extract with a small amount of water. Slowly incorporate this paste into the main mixture, stirring continuously to avoid lumps. Then, add aloe vera gel and glycerin, mixing thoroughly until a smooth and even texture is achieved.

STEP 3)

Add peppermint essential oil and a suitable preservative, blending gently to ensure uniform distribution. Measure the pH of the formulation using a pH meter or pH strips and adjust it to a range between 4.5 and 5.5 using a citric acid solution, added drop by drop while stirring. Once the pH is properly balanced, perform a final mix and transfer the face wash into sterilized, airtight containers. Label the product and store it in a cool, dry place.

EVALUATION TEST OF THE FACE WASH

Physical evaluation:

Physical, characteristics, like, color, look, and uniformity were visually assessed.

Determination of pH:

A calibrated digital pH meter was used to measure the pH of the formulation's 1%aqueous solution at a fixed temperature.

Grittiness: The product was checked for the presence of any gritty particles by applying It on the skin.

Spread ability: On the wooden block a ground glass slide was mounted. On this ground slide, 2 gram of the prepared gel was put. Thereafter, a second glass slide with the same dimensions as the fixed ground slide was sandwiched between this slide and the gel preparation. The hook is provided on the second glass slide. For five minutes, a weight of 500 mg was placed on top of the two slides to remove air and produce a homogenous gel film between them. A specified amount of weight was added to the pan, which was connected to the pulley. The top slide's time (in sec) needed to travel a distance of 5 cm was recorded.

Spread ability was calculated by using the following formula,

$S=M\times L/T$

Were,S-Spread ability

M-Weighttied to the upper slide(20gm). L- Length of the glasss (6.5cm).

T-Timeinsec.

Washability: The product will be painted by hand and was observed under running water

RESULT AND DISCUSSION

The prepared formulations underwent satisfactory results tests for color, smell, consistency, pH, spread ability, washability, and grittiness. Comparatively, the F3 formulation batch was more spreadable than the F1, and F2batches.

Sr.no.	Physical Parameters	Inference		
		F1	F2	F3
1.	Color	Slightly green	Slightly green	green
2.	Odor	Pleasant	pleasant	pleasant
3.	Appearance	Translucent	Translucent	Translucent
4.	Feel on application	Gritty	Less Gritty	Smooth and slipper

Physical examination of formulations

Formulation	pH	Grittiness	Spreadability coefficient (Gm-cm/sec)	Washability	Consistency
F1	4.9	Grittyparticles are present	4.193	Poor	Watery
F2	5.3	Few gritty particle	5.416	Good	Semi-solid
F3	5.4	Nogritty particle	2.6	Good	Semi-solid

Evaluation of formulations

CONCLUSION

In this research three formulations of herbal facewash were prepared and evaluated on the basis of their physiochemical properties like color, odor, taste, pH, spreadaility, grittiness, consistency, washability. The formulation were contained herbal ingredients like Neem (as a antibacterial, analgesics), turmeric powder, peppermint oil, aloe vera, Multanimitti, gram flour, agar powder, sodium benzoate and rose water. From the evaluation studies it was concluded that the prepared formulations underwent satisfactory results tests for color, smell, consistency, pH, spreadability, washability, andgrittiness. Comparatively, the F3 formulation batch was more spreadable than the F1, and F2batches.

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