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Formulation And Evaluation of Antiacne Facial Scrub and Its Action on "Cutibacterium Acne" by Using Different Concentration Of Salicylic Acid

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ABSTRACT

Background: *Acne vulgaris is a common chronic inflammatory skin condition that goes beyond just breakouts—it can significantly impact a person's quality of life. One of the key players in its development is Cutibacterium acnes (C. acnes), a type of bacteria that lives deep within the skin's hair follicles. Recent research shows that C. acnes forms biofilms—protective layers that allow it to survive longer and resist treatment. This biofilm formation is now considered a major reason why the bacteria persist in the skin and become resistant to many antibiotics used to treat acne. As a result, people dealing with acne often not only struggle with physical symptoms like inflammation and discomfort but also with emotional and social challenges that affect their overall well-being.*

Objective: *The objective of this study was to formulate and evaluate a herbal face scrub incorporating salicylic acid and natural ingredients, aimed at providing effective exfoliation with minimal side effects.*

Methods: *Three different face scrub formulations were prepared using varying concentrations of salicylic acid. Each formulation included herbal components known for their skin-friendly and cleansing properties. The scrubs were developed to promote the removal of dead skin cells, excess oil, and impurities from the skin surface. The formulations were evaluated for their physical properties (such as texture, color, and spreadability), pH, grittiness, and stability to determine their overall effectiveness and suitability for topical application.*

Results: *The face scrub prepared in the laboratory closely resembled commercially available scrubs in several key aspects. It was evaluated based on a range of characteristics, including its color, consistency, pH, scent, ease of spreading, viscosity, and how easily it could be washed off. Other important factors like skin irritation potential, texture (grittiness), and ability to produce foam were also assessed. Overall, the results suggested that the lab-made scrub offered comparable quality and performance.*

Conclusion: *The formulated herbal face scrubs, containing salicylic acid as an effective antimicrobial agent, showed desirable cosmetic properties and were comparable to commercial products. Their natural composition and potential in the treatment of acne vulgaris make them a safe and effective skincare option.*

Key words: *acne, face scrub, salicylic acid, formulation.*

INTRODUCTION:

1.1. Acne

Acne vulgaris is one of the most common skin conditions worldwide, especially affecting the sebaceous (oil) glands. It's often linked to the overproduction of sebum, the skin's natural oil. While it's typically associated with teenagers, acne can affect up to 90% of older adults as well. Several factors may contribute to its development, including genetics, hormonal imbalances, overactive sebaceous glands, and bacterial involvement—particularly Cutibacterium acnes (formerly Propionibacterium acnes). Other possible triggers include blocked pores due to excess keratin, secondary infections with bacteria like Staphylococcus aureus, the presence of lipophilic yeasts such as Malassezia furfur, and elevated androgen levels [1]. Acne comes in several different forms, each with its own appearance and severity. The mildest type is **comedonal acne**, which is non-inflammatory and includes whiteheads and blackheads. **Blackheads** (open comedones) look like small dark spots on the skin, caused by pores clogged with a mix of melanin, oil (sebum), and dead skin cells. **Whiteheads** (closed comedones) are small, white or flesh-colored bumps that form when pores are blocked but remain closed.

More inflamed types of acne include **papules** and **pustules**. **Papules** are small, red, raised bumps that are usually less than 5 mm in size. **Pustules** are similar in size but contain pus and are surrounded by redness and inflammation.Severe forms of acne include **nodules** and **cysts**, which develop deeper in the skin. **Nodules** are firm, painful lumps larger than 5 mm, while **cysts** are softer, pus-filled lumps that are typically smaller but still occur deep under the skin's surface. Both can lead to scarring if not treated properly[2]. Acne can lead to a variety of skin lesions, including whiteheads, blackheads, papules, pustules, nodules, and cysts. These breakouts commonly appear in areas with a high concentration of oil glands, such as the T-zone (forehead, nose, and chin), the area between the shoulder blades, and the region between the eyebrows. Along with visible blemishes, acne is often accompanied by symptoms like skin redness, irritation, and tenderness, which can cause both physical discomfort and emotional distress [1].
The skin is home to a diverse community of microbes, with most of the surface bacteria belonging to three main groups: Corynebacteria, Propionibacteria, and Staphylococci. These microorganisms play a vital role in keeping the skin healthy by interacting with one another in a balanced ecosystem. One key player is Propionibacterium acnes (now known as Cutibacterium acnes), a natural resident of oily (sebaceous) areas of the skin. While C. acneshelps maintain skin balance and can even protect against harmful bacteria, it can also act as an opportunistic pathogen in acne. Interestingly, recent research suggests that it's not just the presence or overgrowth of C. acnes that leads to acne, but rather an imbalance between different strains (phylotypes) of C. acnes and other skin microbes that may play a more critical role in triggering the condition [3]. Cutibacterium acnes is a Gram-positive bacillus that naturally forms part of the human skin microbiome. It mainly lives in lipid-rich sebaceous glands, where it thrives. The population of C. acnes is made up of six main phylotypes: IA1, IA2, IB, IC, II, and III. While this bacterium is a normal resident of the skin, certain strains play a significant role in the development of acne. C. acnes can activate the body's innate immune system, trigger ongoing inflammation, and promote both oil production (lipogenesis) and clogged pores (comedogenesis)—key factors in acne formation. Although it was once seen mainly as a harmless skin inhabitant, it is increasingly being recognized as a potential pathogen in acne and other conditions[4].

Pathophysiology

The development of acne is influenced by several interconnected physiological factors. Key contributors include excessive growth of skin cells within hair follicles (follicular hyperproliferation), increased sebum production often linked to elevated androgen levels, and bacterial colonization—particularly by Propionibacterium acnes and Staphylococcus epidermidis.In addition to Propionibacterium acnes and modified follicular keratinization, other variables that contribute to acne include the use of cosmetics, stress, hormonal changes and menstrual cycles, pressing the pimples, and diet [5]. In recent years, our understanding of acne's pathophysiology has expanded to include emerging concepts such as variations in target cell sensitivity, the role of molecular markers, and the influence of neuroendocrine, genetic, and environmental factors. A wide range of both natural and synthetic agents are now recognized for their promising effects in managing acne vulgaris. These therapeutic agents work through diverse mechanisms to help manage acne effectively. Some compounds help regulate sebum production, thereby reducing the oily environment that often contributes to clogged pores. Others act as antibiotics, targeting Propionibacterium acnes and Staphylococcus epidermidis—the key bacterial culprits in acne development. Certain agents possess keratolytic properties, aiding in the removal of excess keratin and preventing the buildup that can trap sebum beneath the skin.The gram-positive anaerobic bacterium P. acnes/C. acnes is widely distributed and mostly found deep within the sebaceous follicle in contact with keratinocytes. It is a member of the Actinobacteria phylum. The gut, stomach, lungs, mouth, conjunctiva, prostate, and urinary system are among the additional tissues where P. acnes/C. acnes is present. In order to maintain the stability of the resident skin microbiota, P. acnes and C. acnes are able to colonize the hostile lipid-rich sebaceous follicle environment and shield skin from other dangerous infections thanks to certain metabolic properties. More specifically, it can break down the triglycerides found in sebum to produce short-chain fatty acids, such as propionic acid, which builds up and helps to maintain an acidic skin pH. Despite ongoing study, P. acnes/C. acnes has been hypothesized as a significant pathogenic component in acne; yet, its preventive role as a commensal bacteria of healthy skin microbiota has been validated, but its contribution to acne pathogenesis is unclear[3].Additionally, anti-inflammatory components help alleviate redness, swelling, and irritation, thereby preventing the condition from worsening [2].

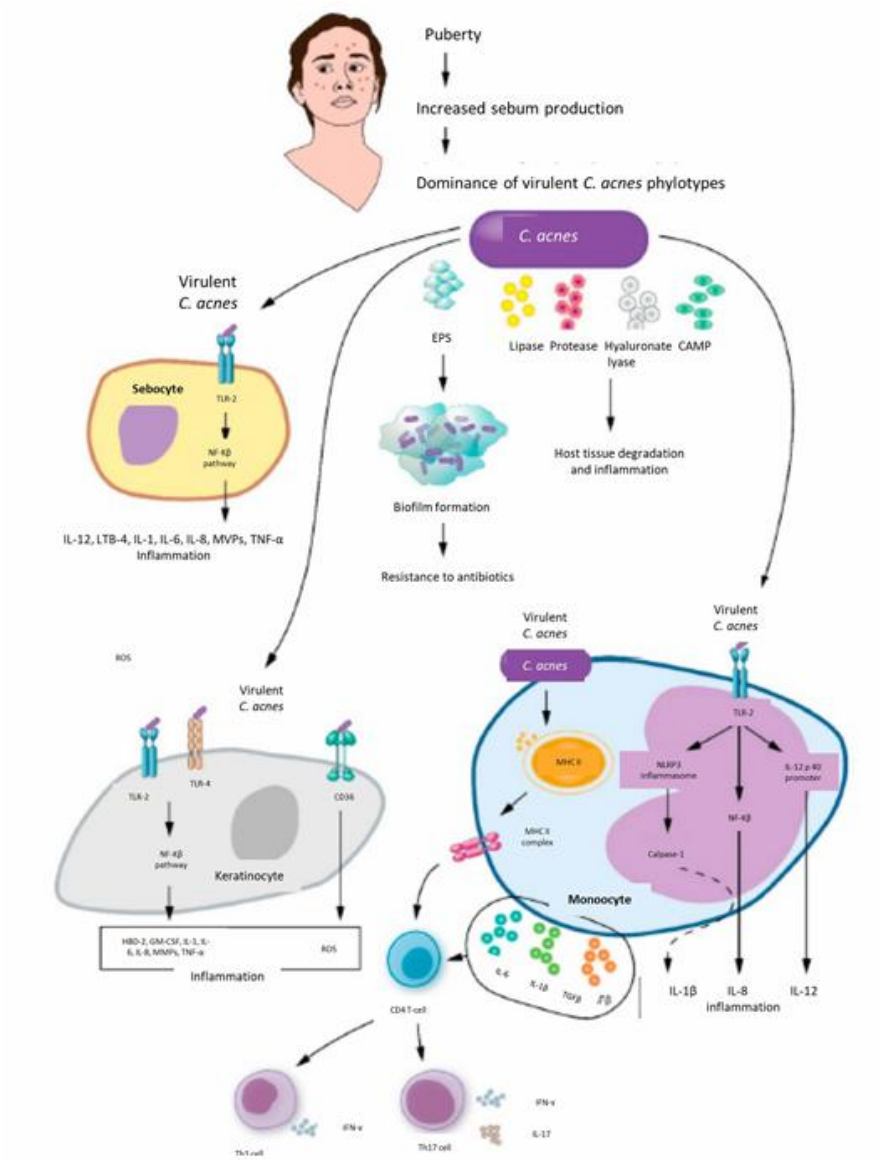


Fig 1. Model of acne pathologic processes induced byC. acnes interactions with sebocytes, keratinocytes, andmonocytes[6].

1.2. **Salicylic acid**

Salicylic acid is a naturally derived compound, often sourced from willow bark and other plants. Salicylic acid is an aromatic hydroxy carboxylic acid ($C_7H_6O_3$) commonly used in skincare, especially for treating acne. Its effectiveness lies in its ability to lower the skin's pH, which helps strengthen the skin's natural defenses against bacteria, viruses, and fungi. Depending on the concentration used, salicylic acid works by gently exfoliating the outermost layer of the skin, removing dead cells and clearing away harmful microorganisms. It also helps speed up the turnover of skin cells, particularly the keratinocytes that form the epidermis. Because of these properties, salicylic acid is widely used for managing both inflammatory and non-inflammatory acne, and is especially beneficial for oily or acne-prone skin [5]. Salicylic acid is a naturally derived compound, often sourced from willow bark and other plants. It's considered safe and is known for its strong antibacterial properties, which have even found applications in food processing and preservation. In skincare, salicylic acid is especially valued for its ability to combat abnormal keratinization—a key factor in acne development—while also providing anti-inflammatory benefits that help soothe irritated skin [6].

1.3. **Anti-acne face scrub**

An ideal face scrub should be gentle yet effective — with mild abrasives that cleanse without being harsh on the skin. Using a face scrub is a simple and refreshing way to keep your skin clean. It helps wash away dirt, oil, and grime from your pores, supports skin elasticity, and encourages healthy cell renewal. Regular exfoliation not only smooths the skin by removing dead cells but also boosts blood circulation, leaving your face feeling fresh and revitalized [8]. It is simple to use a face scrub: simply select a common scrub that suited your skin type, massage it into your moistened skin for a minute, and then rinse it off. The scrub is suitable for all skin types. The essential oil used as a scrub component is the only one that will change according on the kind of skin. There are three types of skin: sensitive, oily, and dry. To encourage blood circulation and oxygenation, gently massage every part of the skin after applying the scrub[9]. A facial scrub is a type of beauty product or cosmetic used to clean and exfoliate the skin of the face and body. Skin cells, sebum, blackheads, and whiteheads may all be eliminated with the use of face scrubs. It also helps maintain the appearance of healthy skin. Whatever the skin type, scrubs are used to treat all skin conditions.Frequent cleaning of the skin's surface is necessary to keep it healthy and appealing by getting rid of dead cells, crusts, sebum, and other secretions, as well as makeup. For example, there are three varieties of skin: dry, sensitive, and oily. If you have dry skin, use the face scrub, which has moisturizing and nourishing ingredients. If the person's skin is sensitive, apply a mild scrub. Depending on the kind of skin, face scrubs should be used twice or three times a week [8].

Scrubbing benefits for the skin

- A good face scrub leaves your skin feeling fresh and clean by removing dirt, oil, sweat, and other impurities that build up throughout the day.
- Regular exfoliation helps unclog pores and sweeps away the dust and debris that settle on the skin, especially in polluted environments.
- Scrubbing gently can also help soothe dry, flaky patches and calm areas of irritated skin, making it easier to manage sensitivity.
- It restores your skin's natural radiance by sloughing off dull, dead skin cells, bringing out a healthier glow.
- Exfoliating regularly can help lighten dark patches—especially around the knees, elbows, and knuckles—by gradually removing built-up dead skin.
- As dead cells, blemishes, and impurities are cleared away, your complexion becomes visibly clearer. If the scrub contains natural skin-brightening ingredients, the results can be even more noticeable.
- It also improves your skin's texture, leaving it softer, smoother, and more defined to the touch.
- Fades Dark Patches: Using a scrub twice a week can help lighten dark areas, especially around the knuckles, elbows, and knees, where skin tends to be thicker and more prone to discoloration.
- Reduces Acne Scars: Gentle exfoliation can gradually fade acne scars by promoting skin renewal and revealing fresher, more even-toned skin underneath.
- For Soft, Smooth Skin**:** Smooth skin doesn't just look better—it feels better too. Regular scrubbing helps you achieve a soft, nourished, and flawlessly smooth complexion that glows with health.

2. MATERIALS AND METHODS

2.1. Materials

All chemicals and ingredients used in this study were of analytical or cosmetic grade and procured from reputable suppliers.

2.1.1. Green tea

- Synonyms: leaf tea, herbal tea, camellia tea.
- Biological name: Camellia sinensis
- Family: Theaceae
- Biological source: Green tea is obtained from the dried, unfermented leaves of Camellia sinensis
- Description: Camellia sinensis is a small evergreen shrub or tree native to East Asia. It has dark green, serrated leaves and bears small white flowers with yellow stamens. Green tea is produced by harvesting the young leaves and buds, which are then quickly steamed or dried to prevent oxidation. This minimal processing helps retain its color, flavor, and high content of natural antioxidants.
- Chemical constituent: Green tea contains a rich profile of bioactive compounds, primarily catechins such as epigallocatechin gallate (EGCG), epicatechin (EC), and epigallocatechin (EGC), which are

powerful antioxidants. It also includes flavonoids, caffeine, theanine, tannins, and essential vitamins like B, C, and E, along with trace minerals such as potassium and magnesium.

- Uses: Green tea is widely used for its antioxidant, anti-inflammatory, and antimicrobial properties. It helps in weight management, improves heart health, supports brain function, and assists in blood sugar control. In skincare, it is valued for treating acne, soothing irritated skin, and preventing premature aging, making it a common ingredient in cosmetic formulations.

2.1.2. Amla powder

- Synonyms: Indian Gooseberry
- Biological name:Phyllanthus emblica
- Family:Phyllanthaceae
- Biological source:Dried and powdered fruit of Phyllanthus emblica
- Description:The fruit is pale greenish when fresh and turns grayish-black upon drying.
- Chemical constituent:Amla powder contains a high amount of ascorbic acid (vitamin C), along with tannins like emblicanin A and B, punigluconin, and pedunculagin. It also includes gallic acid, ellagic acid, flavonoids (such as quercetin), kaempferol, alkaloids, and other phenolic compounds. These constituents contribute to its strong antioxidant and therapeutic activities.
- Uses: Amla powder is widely used for its medicinal, cosmetic, and nutritional benefits. Medicinally, it supports the immune system, improves digestion, regulates blood sugar, and protects the liver. Amla powder is beneficial in the treatment and prevention of acne due to its natural anti-inflammatory, antioxidant, and antibacterial properties.

2.1.3. **Honey**

- Synonyms: Madhu
- Biological name:Apis cerena indica
- Family: Apidae
- Biological source:Honey is a natural, sweet, viscous substance produced by honey bees (Apis species) from the nectar of flowers, which is collected, transformed, and stored in honeycombs within beehives.
- Description:Honey is a thick, golden to dark brown liquid with a sweet taste and pleasant aroma. Its color, flavor, and consistency vary based on the floral source and processing. It is hygroscopic, slightly acidic, and contains trace enzymes and minerals.
- Chemical constituent: Honey mainly consists of sugars like fructose (38%), glucose (31%), sucrose, and maltose. It also contains water (around 17-20%), enzymes (like invertase, amylase, glucose oxidase), vitamins (B-complex), minerals (iron, calcium, potassium), phenolic acids, and flavonoids, which contribute to its antioxidant properties.
- Uses:Honey is widely used for its nutritional, medicinal, and cosmetic benefits. It acts as a natural sweetener, it's used to heal wounds, soothe sore throats, and treat coughs and ulcers.Honey is a well-known natural remedy for acne due to its antibacterial, anti-inflammatory, and healing properties.

2.1.4. Aloe vera

- Synonyms:Aloe; Ghritakumari**.**
- Family:liliaceae
- Biological source: Dried juice collected from incision from the bases of the leaves of Aloe Barbadensis or aloe officinalis**.**
- Description: The leaves are grey to green. Odour- Penetrating odour. Taste- Nauseous and bitter.
- Chemical constituent:Aloe-emodin is main constituent. It also contains vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids.
- Uses:Moisturize skin, treat various skin conditions, including acne, eczema, and sunburn, anti-cancer, anti- oxidant, anti-diabetic.

2.1.5. **Coconut oil**

- Synonyms:Coconut butter, Copra oil.
- Biological name: Cocos nucifera L.
- Biological source: Coconut oil is the oil expressed from the dried solid part ofendosperm of coconut
- Family: Palmae
- Description:White or pearl white. Odour- with peculiar coconut odour. Taste- Bland.

- Chemical constituent:Mix. of triglyceride of saturated fatty acid, caprylic acid, capric acid, lauric acid myristic acid.
- Uses:Nourish dry and cracked skin, replenishing lost moisture and strengthening the skin barrier to retain it.

2.1.6. **Rose water**

- Synonyms: Attar of rose, lavender water, scented liquid.
- Family: Rosaceae
- Biological source:Rose water is obtained from sepals and petals of Rosa damscena through steam distillation.
- Description:a light pink-blush color. Odour- exactly like fresh petals. Taste- Predominantly floral flavor that is not quite Savory, and not quite sweet.
- Chemical constituent:The volatiles mainly consist of linalool, citronellol, nerol, geraniol, etc.
- Uses:Smoothens skin irritation, reduce skin redness, heals cuts and scars, treat burns.

2.1.7. Sodium lauryl sulphate

- Synonyms: lauryl sodium sulphate, sodium salt.
- IUPAC name- Sodium dodecyl sulphate.
- Molecular formula- C12H25NaO4S.
- Molecular weight- 288.38 g/mol.
- Description Colour- White or cream to pale yellow-coloured crystals, flakes, or ` powder. Odour- Faint odour of fatty substances. Taste- A soapy, bitter taste.
- Uses- Anionic emulsifier, as detergent in medicated shampoos, Skin cleanser in topical applications.

2.1.8. Methyl Paraben

- Synonym- Methyl paraben, Methyl p-hydroxybenzoate, Methyl Para hydroxybenzoate,4-hydroxybenzoic acid methyl ester.
- IUPAC name- Methyl-4-hydroxybenzoate.
- Molecular formula- C8H8O3.
- Molecular weight-152.15 g/ mol.
- Description Colour- Colourless crystals or a white crystalline powder. Odour- Odourless.
- Uses- It prevents germ growth, used as preservative.

2.1.9. **Glycerine**

- Synonym- Sugar alcohol, polyol, glycerol
- IUPAC name- Propane-1,2,3-triol.
- Molecular formula- C3H8O3.
- Molecular weight- 92.09382 g/ mol.
- Description Colour- Colourless.
- Odour- Odourless.
- Taste- Sweet taste and non-toxic.
- Uses- Act as moisturizer, as a sweetener in food and beverages, as a solvent.

2.2. Formulation of face scrub

Sr. no.	Ingredients	Quantity for 5gm	Uses
1	Corn flour	1.5gm	As a scrubbing agent
2	Green tea	1gm	As a scrubbing agent
3	Multani mitti	0.5gm	Cleaning of oil and dust particle
4	Amla powder	0.5gm	Antioxidants
5	honey	1.2ml	Antiseptic
6	Aloe vera	0.5ml	Antioxidant, soothing and cooling action
7	Coconut oil	0.1ml	As moisturizers

8	glycerine	1.5ml	As emollient
9	Sodium lauryl sulphate	0.2ml	As foaming agent

2.3. Formulation method

All powdered ingredients—corn flour, green tea, amla powder, cinnamon, and Multani mitti—were accurately weighed and passed through a 120-mesh sieve to ensure uniform particle size. These powders were then thoroughly mixed using a mortar and pestle to obtain a homogeneous blend.

In a separate step, honey, sodium lauryl sulfate, and methyl paraben were precisely weighed and triturated to form a uniform semi-liquid base. The previously prepared powder mixture was gradually incorporated into this base and mixed thoroughly until a consistent scrub formulation was achieved.

Separately, coconut oil, glycerine, and aloe vera gel were combined in a mortar and pestle to form the emollient base. The herbal powder blend was then added to this mixture and triturated to achieve a smooth, paste-like consistency. Rose water was incorporated for fragrance, while beetroot extract was added as a natural coloring agent.

A stock solution of salicylic acid was prepared by dissolving it in ethanol. Measured volumes (2–3 drops) of this stock solution were added to the scrub to formulate three different variants containing salicylic acid at concentrations of 0.5%, 1%, and 2%, respectively.

a) b)

Fig 2.a) grinding of all the constituents in a mortar pistle b) formulated face scrub

3. EVALUATION OF FORMULATION

i. **Color**: The formulated face scrub exhibited a brownish appearance upon visual inspection, indicating uniform blending of the natural ingredients.

ii. **Odor**: The scrub emitted a mild, pleasant, syrup-like fragrance, characteristic of the incorporated herbal and aromatic components.

iii. **Physical State**: The formulation was observed to be in a semi-solid state, suitable for topical application.

iv. **Consistency**: Visual and tactile examination revealed a smooth and uniform consistency, free from clumps or phase separation.

v. **pH**: The pH of the face scrub was measured to be within the range of 6 to 7, which is considered skin-friendly and appropriate for cosmetic formulations intended for facial use.

Fig 3. pH of formulated scrub

1. Spreadability: It establishes how easily the gel will travel across the skin. A glass slide with a small bit of material on it was covered by another slide. Measurements are made of the weight placed on the slide, the spread, and the spread time.

Fig 4. Spreadability test of the formulated scrub

2. Irritability: After applying a small amount of gel to the skin and waiting a few minutes, it was discovered that the skin was not irritable.

Fig 5. irritation test on skin

3. Washability: A small amount of gel was applied to the skin, and after a few minutes, it was discovered to be washable with water.

4. Anti-acne evaluation:

A. **Preparation of nutrient media** –First, 2 grams of agar powder were accurately weighed and dissolved in 100 mL of distilled water in a conical flask with the application of heat. The prepared medium was then sterilized in an autoclave at 121 °C for 15–20 minutes along with sterile Petri plates. After sterilization, the molten agar was poured into the Petri plates under aseptic conditions and allowed to solidify at room temperature for several minutes.

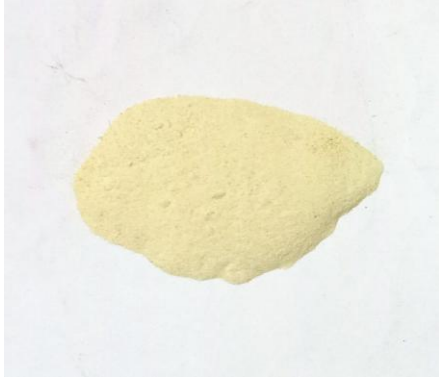


Fig 6. Preparation of Nutrient media

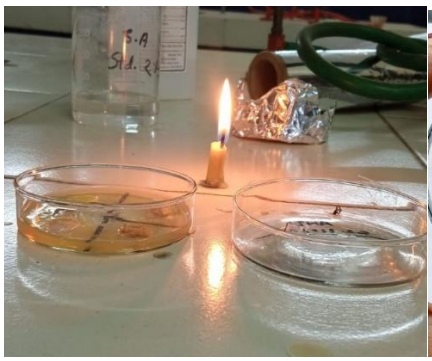
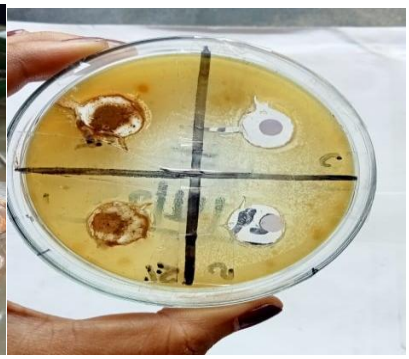
B. **Inoculation of bacterial (cutibacterium acne)**- A volunteer exhibiting active facial acne was selected for sample collection. A skin swab was taken from the affected area to obtain a sample of Cutibacterium acnes. The sample was then inoculated onto a Petri plate containing sterile nutrient agar and incubated at 37 °C for 14 days to allow bacterial growth.

a) b)

Fig 7. a) Aseptic Inoculation Procedure b) bacterial Growth on Nutrient Agar

C. **Well diffusion method / Agar well diffusion method** :First, nutrient agar media was prepared and poured into sterile Petri plates. After solidification, wells were created in the agar surface using a sterile borer. Under aseptic conditions, each well was filled with the test sample (salicylic acid-containing face scrub), sterile water (as control), and the Cutibacterium acnes culture solution. The plates were then incubated at 37 °C for 14 days. After incubation, the diameter of the clear zones (zones of inhibition) around each well was measured to assess the antimicrobial activity of the formulation.

a) b)

b) d)

Fig 8. a)

Measurement of Inhibition Zone

The diameter of the inhibition zone was measured using a transparent ruler, from one edge of the clear zone to the opposite edge, passing through the center of the well. The measurements were recorded in millimeters (mm). This procedure was repeated three to four times to ensure accuracy, and the mean diameter was calculated to represent the antimicrobial efficacy of the formulation.

Formula for Mean Inhibition Zone:

Mean diameter (mm)= sum of all measurement

Number of measurements

Mean = 1.5 mm+1.7 mm+ 2mm+ 1.6mm

4

= 1.7mm

4. **RESULT AND DISCUSSION:** The herbal face scrub was successfully prepared and evaluated in the laboratory. The formulation was assessed based on various parameters including appearance, pH, viscosity, spreadability, washability, and potential for skin irritation. It met all the required characterization standards.The scrub contains salicylic acid as the primary active pharmaceutical ingredient (API), which exhibits antibacterial activity against Cutibacterium acnes, the bacterium responsible for acne. Additional ingredients include green tea powder, amla powder, and corn flour. Green tea powder serves as a natural exfoliant, helping to remove dead skin cells, enhance blood circulation, and provide effective scrubbing action. Amla powder aids in the removal of excess oil, sebum, and skin secretions while also helping to lighten skin tone and reduce acne-induced dark spots. Corn flour contributes to cleansing the skin by removing dirt and oil particles.Multani mitti (Fuller's earth) enhances the cleansing action by absorbing impurities, while coconut oil and aloe vera offer moisturizing and soothing effects, making the scrub suitable for various skin types.

5. CONCLUSION

As the body's outermost barrier, the skin is continuously exposed to environmental stressors such as UV radiation, pollutants, and chemicals. This study aimed to formulate and evaluate an anti-acne herbal face scrub using natural exfoliating agents. Based on the evaluation parameters, the developed formulation demonstrated excellent characteristics in terms of appearance, color, fragrance, texture, pH, spreadability, washability, and foamability. Importantly, it showed no signs of skin irritation during the patch test and was compatible with all skin types—dry, oily, combination, and normal.

Due to the exclusive use of natural ingredients, the risk of adverse effects was minimal. Additionally, the scrub exhibited antibacterial activity against Cutibacterium acnes, a key bacterium involved in acne pathogenesis. The formulation proved to be safe, effective, affordable, and multifunctional, contributing to clearer, brighter, and healthier-looking skin. Therefore, the anti-acne herbal face scrub developed in this study can be considered a promising cosmetic product for regular skincare.

Author contribution : Under the guidance of Mrs. Ankita Damahe give the demonstration of to perform lab work , Mrs Pragya Thakur contributed the literature review, Ms Antra Sahu prepared the medicament for future perception, method and material, rest of member contribute the valuable work.

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Conflict of interest : none

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