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FORMULATION AND IN VITRO CHARECTERIZATION OF HERBAL SOAP WITH THE USE OF NATURAL ANTIFUNGAL AGENT

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ABSTRACT

The increasing demand for natural and safe personal care products has led to a growing interest in herbal soaps formulated with natural antifungal agents. This research paper aims to explore the formulation and in vitro characterization of an herbal soap containing natural antifungal agents. The study focuses on assessing the effectiveness of these agents against fungal pathogens and evaluating the physical and chemical properties of the soap. Various natural antifungal agents such as neem oil, tea tree oil, and turmeric extract were selected based on their known antimicrobial properties. These agents were incorporated into a base soap formulation containing skin-nourishing ingredients like coconut oil, shea butter, and glycerine. Microbial challenge testing demonstrated the efficacy of the herbal soap against various fungal strains, highlighting its potential as an antifungal agent.

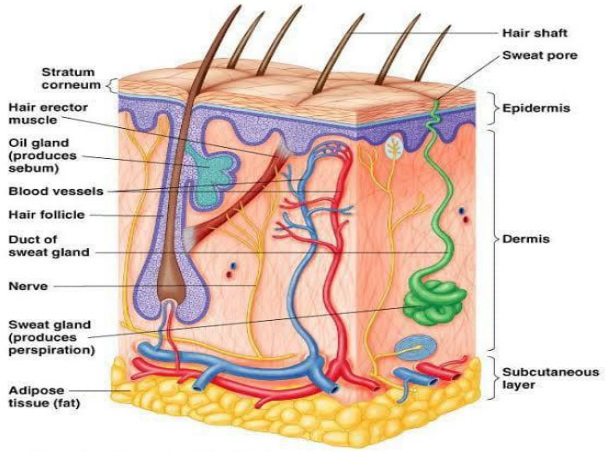
In conclusion, the developed herbal soap formulation with natural antifungal agents exhibits promising antimicrobial properties along with desirable sensory attributes.

Key word: Herbal, Antifungal , Allicin,

1. INTRODUCTION

1.1 skin

Our skin is home to millions of bacteria, fungi and viruses that compose the skin microbiota. Similar to those in our gut, skin microorganisms have essential roles in the protection against invading pathogens, Skin acts as a protective barrier against pressure and trauma. It also acts as a barrier for external environments including pollution, sunlight, radiation, harmful microbes, and chemical.



The skin is composed of three layers:

1.1.1 Epidermis

The epidermis constantly makes new cells in its lower layers. Over the course of around four weeks, these cells make their way to the surface, become hard, and replace the shedding, dead cells.

1.1.2 Dermis.

The reason the dermis can perform these functions is that it houses the hair follicles, blood vessels, and lymphatic vessels. It is home to a number of glands, including sweat glands and sebaceous glands, which produce sebum, an oil that lubricates and waterproofs hair.

1.1.3 Subcutaneous tissue

The hypodermis mostly fat, connective tissue, and elastin, which is an elastic protein that helps tissues return to their normal shape after stretching. The high levels of fat help insulate the body and prevent a person from losing too much heat. The fat layer a so acts as protection, padding the bones and muscles,

1.2 Garlic oil

Garlic oil is used, because it shows the antifungal, antibacterial, properties. When garlic cloves are chopped or crushed, a compound called Allin comes into contact with an enzyme called alliinase, which forms an antibacterial chemical called allicin. that allicin helps in destroying fungi as well as bacteria. *Allium sativum L*., commonly known as garlic, belongs to the onion family, lilliaceae Garlic was likely originated in Central Asia and it has been in use throughout the world for both culinary and medicinal purposes. The garlic oil, rich in sulfureted organic compounds, contains a variety of sulphides such as diallyl disulfide and dilly trisulfide.

1.3 Soap

Soap is common cleansing agent well known to everyone. Personal aim of our study to develop the herbal hygiene soap by using cold process method and having antimicrobial agent. Persons having skin issues like dryness, itching, acne, contact dermatitis are referred by Dermatologist and advised to use specific skin care products including specific type of soap according to skin type and related issues of patient. Various skin types are normal, oily, dry, combination, or sensitive skin types. Factors like pH of soap and ingredients used as surfactants, high leather forming agents, colours, fragrances, can contribute skin related issues.

2: Material and Method

a. **Soap Base:** Use a pre-made soap base or formulate one using ingredients like coconut oil.
b. **Antifungal Agent:** Prepare garlic oil by crushing fresh garlic cloves and infusing them in a carrier oil such as coconut oil or olive oil.
c. **Moisturizing Agent:** Optionally, include other essential moisturizing agents with antifungal agents such as glycerine.
d. **Vehicle:** Distilled water used as vehicle.
e. **Preservative:** Include preservative like Methyl paraben to enhance the shelf life of the soap.
f. **Equipment:** Double boiler or microwave for melting the soap base. Mixing bowls and utensils for blending ingredients. Soap Molds for shaping the soap bars. pH meter for checking the pH of the soap.

2.1 Formulation table:

Tabel No1: Formulation of Antifungal Soap

Sr. No.	Ingredients	Quantity	Role of Ingredients
1	Soap base	20gm	Cleansing agent
2	Garlic oil	4ml	Antifungal agent
3	Methyl paraben	0.13mg	Preservative
4	Glycerine	4.8ml	Moisturizing agent
5	Distilled Water	3.34ml	Vehicle
6	Perfume	7.73ml	Fragrance

2.2 Procedure

1. Weight the soap base given quantity in a table.
2. melting the soap base using a double boiler or microwave until it becomes a liquid. Soap base was stirred continuously by glass rod.
3. Adding garlic oil drop wise to the liquify melted soap base.
4. Include distilled water in different beaker and add glycerine, methyl paraben.
5. Stir the mixture thoroughly to ensure even distribution of ingredients.
6. Add perfume as quantity sufficient for fragnence.
7. Check and adjust the pH of the soap.
8. Pour the soap mixture into the soap molds and allow it to cool. This process may take several hours.
9. Once the soap has solidified at room temperature, and observed the many changes in prepared soap.

3: Evolution parameter

3.1 Organoleptic evaluation: Organoleptic evaluation (colour, clarity) was done by sensory and visual inspection.

3.2 Determination of pH: The pH of prepared herbal formulation (soap) was determined by using a digital pH meter.

3.3 Foam Height: Dissolved 0.5gm of prepared soap in distilled water then make up the volume up to Foam Height: Dissolved 0.5gm of prepared soap in distilled water then make up the volume up to 50ml with distilled water in100ml

measuring cylinder. Measured the foam height, above the aqueous volume by given 25 strokes.

3.4 Determination of percentage free alkali:

Dissolved 5gm of prepared herbal soap in 50ml of neutralized alcohol in a conical flask. Then boiled under the reflux on a water bath for 30 minutes. Then cooled and added 1ml of phenolphthalein solution as an indicator. Then the solution was titrated with 0.1 HCL. 3.4.

3.5 Foam Retention:

Prepared the 25ml of the 1% soap solution and transferred into the 100ml of measuring cylinder. Then the cylinder was shaken 10 times. The volume of foam was recorded at one minute for 4 to 5 minutes7.

3.6 Alcohol Insoluble Matter:

Dissolved 5gm of prepared soap in warm ethanol. Then filter the solution with a tared filter paper. Then dried filter paper at 105ºC. Then the weight of the dried paper was taken and calculated than % alcohol insoluble matter.

4: Zone of Inhibition of soap with garlic oil

Table No. 2: Antimicrobial Testing on Antifungal

Sr .No.	Microorganism	Diameter of zone of inhibition	
		F3	Std.
1.	Proteus Vulgaris	1.6cm	1.7cm
2.	Proteus Vulgaris	2.8cm	1.6cm
3.	Bacillus	1.4cm	1.2cm
4.	Bacillus	1.3cm	0.8cm
5.	pseudomonas aeruginosa	1.2cm	1cm
6.	pseudomonas aeruginosa	1.2cm	0.9cm
7.	Staphylococcus aureus	2.7cm	1.7cm
8.	klebsiella pneumonia	0.9cm	1cm

5 Result

5.1 Physiochemical Parameter

Table No. 3: Physicochemical Parameter of Antifungal Soap

5.2

Sr. No.	Parameter	Result
1.	Formulation	Soap
2.	Colour	Dark Green
3.	Odour	Aromatic
4.	Appearance	Very Good
5.	pH	7.2
6.	% Free alkali	0.42
7.	Foam height (cm)	22 cm
8.	Foam retention (min)	1.5 min
9.	Alcohol insoluble matter	9.6 %

Discussion:

The results will provide insights into the efficacy of the formulated herbal soap against fungal pathogens. The antimicrobial activity of the soap will be assessed by measuring the inhibition zone or determining the minimum inhibitory concentration (MIC) against different fungal strains. The physical and chemical properties of the soap, such as pH, appearance, hardness, and foaming ability, will also be discussed.

6: Conclusion:

This research aims to develop and characterize a herbal soap formulation containing natural antifungal agents. The findings will contribute to the growing body of knowledge on natural alternatives for personal care products. If proven effective, this herbal soap could offer a safe and sustainable option for preventing and managing fungal infections. Further studies on the soap's stability, safety, and clinical efficacy may be warranted to validate its potential for commercialization and widespread use.

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