

A RESEARCH ON: FORMULATION AND EVALUATION OF HERBAL SOAP USING BANANA PEEL FOR DETANING AND SKIN BRIGHTENING

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ABSTRACT

Herbal cosmetic products are widely preferred today due to their natural origin, safety, and fewer side effects compared to synthetic skincare products. Common skin conditions like acne, tanning, pigmentation, and dull skin need gentle and effective treatment methods. Banana peel, usually considered a waste material, is rich in useful compounds such as antioxidants, flavonoids, phenolic substances, vitamins, and antimicrobial agents that support healthy skin. These natural components help in acne control, tan reduction, removal of dead skin cells, and enhancement of skin brightness. This review paper explains the formulation and evaluation of herbal soap prepared using banana peel extract for anti-acne, skin detaining, and skin brightening purposes. It focuses on the importance of banana peel as a natural, affordable, and environmentally friendly ingredient in herbal cosmetic preparations. The review also includes methods of soap preparation, suitable excipients used in formulation, and evaluation tests such as pH, foam retention, hardness, stability, and skin safety. Using banana peel in herbal soap promotes proper utilization of agricultural waste and provides an economical skincare option. This study highlights the future scope of banana peel as a valuable ingredient in cosmetic and pharmaceutical formulation.

KEYWORDS: Banana Peel Extract, Natural Herbal Soap, Anti-Pimple Activity, Tan Removal, Skin Glow Enhancement, Gentle Skin Exfoliation.

INTRODUCTION

The skin is the biggest organ of the human body and serves as the first line of defense against pollution, dust, sunlight, and harmful microorganisms. Skin problems like acne, tanning, pigmentation, and dullness are very common and can affect both appearance and skin health. Acne mainly develops due to bacterial growth, excess sebum production, and blockage of skin pores, whereas tanning and pigmentation are usually caused by continuous exposure to sunlight and environmental factors. These issues can lead to uneven skin tone, dryness, irritation, and reduced skin glow. Although many synthetic skincare products are available, they may sometimes cause side effects such as dryness, irritation, and long-term skin sensitivity. Banana peel from *Musa paradisiaca* is generally treated as waste, but it contains

many useful bioactive substances like antioxidants, flavonoids, phenolic compounds, vitamins C and E, potassium, and antimicrobial components. These natural compounds help protect the skin from damage caused by free radicals, reduce inflammation, and control bacterial growth. Banana peel also supports gentle exfoliation by removing dead skin cells and promoting fresh skin renewal. Ferulic acid and other phenolic compounds present in banana peel help reduce tanning, acne marks, and pigmentation while improving skin brightness. This study is based on the formulation and evaluation of herbal soap containing banana peel extract for anti-acne, detaining, and skin brightening purposes, offering a natural, safe, affordable, and eco-friendly skincare option.

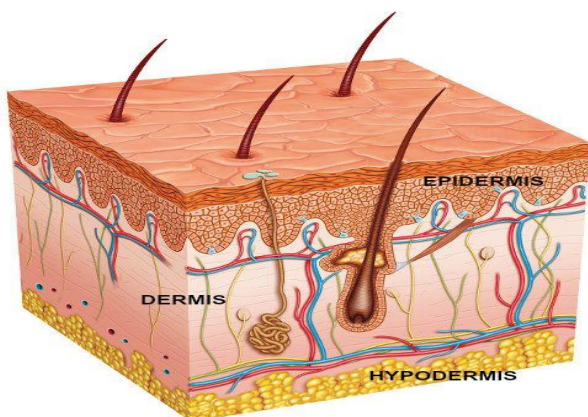


Fig:-1.

Common diseases like

1. Acne

Acne is a frequently seen skin problem that develops when skin pores become blocked by excess oil, dead skin cells, and bacterial infection, mainly caused by *Cutibacterium acnes*. It results in pimples, blackheads, whiteheads, swelling, and redness on the skin. Acne is mostly seen in adolescents and young adults and, if not treated properly, may leave scars or dark marks on the skin.

2. Skin Tanning

Skin tanning happens due to long exposure to sunlight, especially harmful ultraviolet (UV) rays. To protect itself, the skin produces more melanin, which causes the skin to become darker. Continuous tanning may result in uneven skin tone, loss of brightness, and pigmentation.

3. Pigmentation

Pigmentation is the condition in which dark spots or patches appear on the skin because of increased melanin production. It may be caused by sunlight, acne scars, hormonal imbalance, or skin irritation. This condition affects the natural brightness and smooth appearance of the skin.

4. Dull Skin

Dull skin looks dry, rough, and less radiant because of the buildup of dead skin cells, lack of moisture, pollution, and improper skin care. It decreases the natural glow of the skin and usually requires proper exfoliation and nourishment for improvement.

Need of Work

1. Common skin concerns such as pimples, tanning, pigmentation, and loss of skin glow affect many people
2. Synthetic skincare products can sometimes lead to dryness, irritation, and other unwanted effects
3. The demand for herbal, safe, and naturally derived cosmetic products is increasing rapidly.
4. Effective natural remedies are needed for acne

treatment, tan reduction, and improving skin brightness

5. Banana peel is generally thrown away as waste, although it contains many valuable skin-friendly compounds
6. It contains antioxidants, flavonoids, vitamins, and antimicrobial components that support healthy skin
7. Utilizing banana peel helps in environmentally friendly and sustainable waste management
8. Herbal soap prepared from banana peel can be an affordable and beneficial product for everyday skincare
9. Research on banana peel extract specifically used in herbal soap preparation is still limited

❖ Plant Profile of Banana Peel

- Scientific Name- *Musa paradisiaca*
- Common Name- Banana
- Family- Musaceae
- Kingdom- Plantae
- Part Used- Peel
- Biological Source- Peel of ripe fruit of *Musa paradisiaca*



Fig:-2.

MATERIALS AND METHODS

Banana peel extract

Banana peel is obtained from the fruit of *Musa paradisiaca*, which belongs to the family Musaceae. The peel is the outer covering of the banana fruit and is usually discarded as agricultural waste, but it contains many valuable bioactive compounds useful for skin care. Banana peel is rich in antioxidants, flavonoids, phenolic compounds, ferulic acid, Vitamin C, Vitamin E, potassium, and antimicrobial agents. These constituents help protect the skin from oxidative damage, reduce inflammation, and control bacterial growth.

1. Anti-acne
2. Detanning
3. Exfoliation
4. Brightening
5. Antioxidant
6. Moisturizing
7. formulation of soap

Table 1: The formula is preparation of herbal soap.

INGREDIENT	F1	F2	F3	ROLE
Banana peel powder	5g	7.5 g	10 g	Antioxidant, vitamin and for detanning, exfoliating agent
Glycerine soap base	60 g	57.5 g	55 g	Smooth texture, shape, moisture effect
Coconut oil	10 g	10 g	10 g	Cleansing and foam formation and foam formation
Castor oil	5 g	5 g	5 g	Lather improvement
Vitamin e oil	1 g	1 g	1 g	Antioxidant
Sodium benzoate	0.5 g	0.5 g	0.5 g	Preservative
Beet root powder	q.s.	q.s.	q.s.	Appearance
Distilled water	q.s.	q.s.	q.s.	Mixing

PREPARATION METHOD

- Collection of Banana Peel**

Fresh peels of *Musa paradisiaca* were collected and thoroughly washed with distilled water to remove adhering dust, dirt, and other foreign particles. The cleaned peels were then prepared for the extraction process.

- Extraction of Banana Peel**

1. The collected banana peels were first washed properly and dried under shade for about 5–7 days to remove moisture naturally.
2. After complete drying, the peels were ground into a fine powder using a grinder. Approximately 70 g of the powdered material was transferred into a clean container, followed by the addition of 350 mL of 70% ethanol or distilled water as the extraction solvent.
3. The mixture was kept for maceration for 48–72 hours with occasional stirring to ensure proper extraction of phytoconstituents. After completion of the maceration process, the mixture was filtered using muslin cloth or filter paper to separate the liquid extract from the solid residue. The obtained filtrate was then concentrated on a water bath maintained at 50–60°C until a thick extract was formed. Finally, the concentrated extract was collected and stored in an airtight container for further use.

**Fig 3: Dry Banana Peel.****Fig 3: Extract of banana peel.**

- Preparation procedure**

1. Weigh all ingredients accurately.
2. Melt glycerine soap base using water bath at 60–70°C.
3. Remove from water bath and add coconut oil and castor oil with stirring.
4. Dissolve sodium benzoate in warm distilled water and add to mixture.
5. Add banana peel extract, turmeric powder, and Vitamin E oil.
6. Stir continuously for uniform mixing.
7. Pour mixture into Molds and tap gently to remove air bubbles.
8. Cover Molds lightly and allow to solidify for 12–24 hours.
9. Remove soap from Molds and store properly for evaluation.

**Fig 4: melting soap base.**



Fig 5: Herbal Soap in mould.



Fig. 6: Herbal Soap after cooling.

EVALUATION OF SOAP

➤ Organoleptic evaluation

- Colour -brown
- Shape -square
- Texture -smooth
- Appearance –good

• Physico-chemical evaluation

• pH

The pH of the prepared herbal soap was measured using a digital pH meter. About 1 g of soap was dissolved in 10 mL distilled water and stirred properly to obtain a uniform solution. The pH meter was first calibrated using standard buffer solution. The electrode was then dipped into the soap solution, and the pH value displayed on the meter was recorded carefully. After measurement, the electrode was washed with distilled water and dried properly.

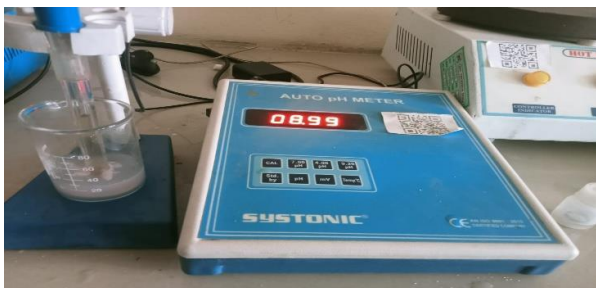


Fig 7: ph meter.

• Foam height

Foam height of the prepared herbal soap was evaluated to determine its foaming ability. About 1 g of soap was

dissolved in 50 mL distilled water in a measuring cylinder and shaken vigorously for 1 minute. The cylinder was allowed to stand for few minutes, and the height of foam produced was measured in centimeters. Greater foam height indicates better foaming property of the soap formulation.



Fig 8: foam height.

• Moisture Content Test

The moisture content of the prepared herbal soap was determined to evaluate its stability and shelf life. A known weight of soap sample was taken and weighed accurately. The soap was then dried in a hot air oven at suitable temperature until constant weight was obtained. After drying, the soap was cooled and weighed again. The difference in weight before and after drying indicated the moisture content present in the soap formulation.



Fig 9: Moisture content.



• Foam Retention Test

The foam retention of the prepared herbal soap was evaluated by dissolving 1 g of soap in 50 mL distilled water in a measuring cylinder and shaking vigorously for 1 minute to produce foam. The initial foam height was

measured immediately, and the cylinder was allowed to stand undisturbed for 5 minutes. The foam height was measured again after 5 minutes to determine foam

stability. Higher foam retention indicates better foam stability and good quality of the soap formulation.

Table No 2:- Evaluation of Soap.

Sr.No	Parameter	F1	F2	F3
1	Colour	Light brown	Dark brown	Dark brown
2	texture	smooth	smooth	smooth
3	Foam height	3.0 cm	3.5 cm	4.0 cm
4	Foam retention	80%	85%	90%
5	Appearance	good	good	good
6	shape	circle	square	square
7	ph	8.9	8	7.9
8	Moisture content	10%	11%	12%

RESULTS AND DISCUSSION

The prepared banana peel herbal soap formulations (F1, F2, and F3) were evaluated for various physicochemical parameters such as colour, texture, foam height, foam retention, appearance, shape, pH, and moisture content. All formulations showed smooth texture and good appearance, indicating satisfactory formulation characteristics and uniform mixing of ingredients. The colour of the soap changed from light brown in F1 to dark brown in F2 and F3 due to the increase in concentration of banana peel extract. Different shapes were observed according to the Molds used during preparation. The foaming ability of the formulations was found to increase gradually from F1 to F3. F1 exhibited foam height of 3.0 cm, F2 showed 3.5 cm, while F3 produced the highest foam height of 4.0 cm, indicating good cleansing and foaming properties. Foam retention values ranged from 80% to 90%, demonstrating satisfactory foam stability in all batches. The pH values of the prepared soaps were found between 7.9 and 8.9, which are considered acceptable for herbal soap formulations and suitable for topical application on skin. The moisture content of the formulations varied from 10% to 12%. A slight increase in moisture content was observed with higher concentration of banana peel extract. Adequate moisture content contributed to smooth texture and proper consistency of the soap. Among all the formulations, F3 showed comparatively better foam height, foam retention, and acceptable pH, indicating improved overall performance and stability of the herbal soap formulation.

CONCLUSION

The study was carried out to formulate and evaluate a herbal soap containing banana peel extract as the primary natural ingredient. The prepared formulations demonstrated satisfactory physical and functional properties, including smooth texture, good appearance, acceptable pH, adequate foam formation, and stable foam retention. The presence of banana peel extract and turmeric contributed to the cleansing, antioxidant, antimicrobial, and skin-enhancing properties of the formulation. Among the different batches prepared, formulation F3 exhibited comparatively improved performance with better foam stability and suitable

physicochemical characteristics. The findings of the study indicate that banana peel, which is generally discarded as agricultural waste, can be effectively utilized in the preparation of value-added herbal cosmetic products. The formulated herbal soap may provide a natural, economical, eco-friendly, and safer alternative to conventional chemical-based soaps for skincare applications.

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