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DEVELOPMENT AND STANDARDIZATION OF HERBAL BATH POWDER FOR SKIN WHITENING AND DIRT REMOVAL BY USING LOW-COST INDIGENOUS TECHNOLOGY

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ABSTRACT

The skin, the largest organ in the human body, is crucial in protecting the body from pathogenic, chemical, thermal, and mechanical threats. Otherwise, all of these things may have an effect on the body's physiological status. The skin is a mirror of an individual's physical appearance, and maintaining it perfectly is critical due to the skin's continuous exposure to UV radiation. Cosmetics not only improve the appearance of the skin, but they also boost the lifetime of good health by preventing skin disorders. The skin care products nourish the skin's health, texture, and integrity, while also hydrating and retaining skin elasticity. Synthetic skin treatments contain ingredients that are not always eco-friendly and are thus commercially unviable. Some prior art skin products may contain ingredients that are potentially damaging to the skin. The biological processes of the skin are impacted by herbal cosmetic ingredients, which also provide the nutrients needed for healthy skin. Natural skin-care products are hypoallergenic and rapidly absorbed by the skin's superficial layers. The development and standardization of a herbal bath powder for skin whitening employing low-cost indigenous technology is the main objective of the present study work. Commercially available shade-dried turmeric, zeera powder, rice flour, green gram flour, orange peel, and other natural powders are employed. All natural powdered ingredients were initially sieved by using #120 mesh, accurately weighed powders, and geometrically blended for equal preparation before

being analyzed for characteristics such as macroscopical, phytochemical, irritancy, antimicrobial, and stability studies. As a result, in this study, we formulate herbal bath powder from widely accessible ingredients. We found that the flow properties were good, that there was no skin irritation, and that the storage conditions were stable. The outcomes of the study scientifically proved that herbal bath powder have the potential to provide an excellent glowing effect on skin. Due to the benefits to humans, the overall study is beneficial for substantiating product claims.

KEYWORDS: Herbal ingredients, Turmeric, Skin whitening, Skin care products, Hydrating, Retaining.

INTRODUCTION

AYUSH are just a few of the officially accepted alternative health care therapies that have been used in India for a very long period of time in a safe and continuous manner. These organizations have legitimately coexisted with allopathy.[1] Ayurvedic, nutraceutical, and polyherbal formulations are experiencing rapid growth on the market as a consequence of growing interest in the usage of plant-based formulations.[3] millions of Indians consume daily medicinal herbs as spices, home remedies, health foods, over-the-counter (OTC) prescription drugs for self-medication, and medications prescribed by non-allopathic medical systems. Due to the widespread usage whitening cosmetics, herbal research has progressed significantly.

Herbal bath powders have been used for centuries, and they do much more than simply clean our skin. Herbal bath powders are one of the simplest methods to include herbal products into our daily lives. Bath powders, which include body wash and face wash powders, are produced with anti-bacterial, astringent, healing, cleansing, healing, antiseptic, and nourishing characteristics that maintain the skin blemish-free. Bath powder can be made at home using common household and kitchen ingredients. Herbal bath powders are less expensive and have no negative effects for naturally achieving fair skin; individuals use herbs to clean, beautify, and control their skin. Natural bath powder and masks created at home promote smooth, bright, and velvety skin. Bath powder is a soft powder that is used for applying to the body. An excellent herbal bath powder must offer nutrients to the skin and reach the subcutaneous tissues. Because of their initial good, most soap bars and gels on the market contain various chemicals, such as parabens, synthetic scents, formaldehyde, and so on. Nonetheless, extended exposure to these substances may cause skin damage.

Benefits of applying bath powder

1. Cleanse the body skin to relieve dryness, irritation, and redness.
2. Works as a light exfoliator, gently removing dead skin and keeping your skin clear of pollutants. Orange peel and green gramme flour nourish and exfoliate your skin, rejuvenating it.
3. Prevents bacterial and fungal skin infections and allergies since bath powder ingredients contain antioxidants and anti-inflammatory chemicals.
4. Remove scars
5. Makes your skin glow and healthy by removing dead skin cells and giving it a pleasant glow.
6. Adulterant free and chemical free

Objective

Everything, as we all know. The era of Ayurveda or medications with herbal origin has varied in this world over thousands of years. However, in recent decades, it has been supplanted by the allopathic system of medication, which was readily authorized universal, but later due to its numerous negative effects, men have immediately turned to Ayurveda medicine because of its improved pharmacological, therapeutic results and assurance profile. World population are becoming more accepting in herbal origin extracts and drugs, with a rise in demand for face washes, face packs, hand sanitizers, bath powders, natural home remedies, liver disease, hypertension, diabetes, cancer, arthritis, and skin disease, among many other things. It has been decided that a thorough scientific validation of turmeric, almond, orange peel, red masoor dal, zeera, green gramme, pomegranate peel powder, rice, and gram flour will be carried out due to their effectiveness against microbial agents and removal of dead skin cells as claimed by natural home remedies and tribal people. The powders selected for the entire investigation were selected based on their ease of availability, lack of research work, and folklore stating it enhances body skin tone and washing action. Only a few products have been developed using these powders thus far. As a consequence, this powder has a broad scope for detailed pharmacognostical preliminary phytochemical and pharmacological research. Because a few powders have antibacterial properties, they can also be utilised to treat microbial skin issues. We have the ability to create herbal bath powder.

Precautions to be taken while applying bathpowder

Choose a bath powder that is appropriate for your skin type. Before using bath powder, see a natural therapist or a skin professional. Bathpowder should not be applied to the body for more than 15 to 20 minutes. The formation of wrinkles, sagging skin, and the expansion of open pores may be carried on by keeping for a prolonged period of time. Bathpowder should be used twice a week. Smoothly rubbed across our skin. Before removing dried bathpowder, spray the body with room temperature water. Wash the body with cool or warm water after removing the material. This aids in the closure of open pores and tightening of the skin. It also brightens and soothes the skin.

MATERIALS AND METHODS

Orange peel, almonds, turmeric, red masoor dal, rice flour, gram flour, and green gram were all purchased from a local market. Orange peel, pomegranate seeds, green gramme pulses, almond, and turmeric rhizomes were collected and dried before being ground into a fine powder using a size reduction mill.

Method

1. First, all of the powders were sieved through mesh 120# to guarantee particle size homogeneity and fineness.
2. Weigh each powder individually.
3. Perfume is absorbed onto a portion of talc that has been weighed.
4. All of the powders are combined in a geometric proportion, and the perfume that has been absorbed is included into the powder mixture.
5. After consistent mixing, spread this powder in a thin layer on a sheet of paper using a spatula.
6. The bath powder is then placed in a labelled container.

Chemicals: Hydrochloric acid, Wagner's reagent, Lead acetate solution, Ferric chloride, Fehling solution, Benedict reagent, Hager's reagent, acetic anhydride, sodium nitroprusside, Sulfuric acid, Mayer's reagent, Million's reagent, Dragendroff's reagent, Chloroform, glacial acetic acid, Beef extract, sodium chloride, Agar, Peptone, Distilled water.

Apparatus: Test-Tube Holder, Conical Flask, Petri Plate, China Dish, Beaker, Crucible, Funnel, Test-Tube, wide mouth bottle. Instrument Bulk Density Apparatus, Hot Air

Sterilization, Incubator, Hot Air Oven, Autoclave, Laminar Air Flow, Digital pH Meter, Muffle Furnace.

Phytochemical screening

1. **Dragendroff test:** Remove the alcoholic extract add diluted Hcl to the residue, and shake filter. Add a few drops of Dragendroff's reagent into 2 to 3 ml of filtrate. Alkaloid is found when orange-brown precipitate is observed.
2. **Mayer's test:** Add 1 ml of Mayer's reagent to 1 ml of extract (potassium mercuric iodide solution). Alkaloids were observed when a precipitate is whitish yellow or cream in color.
3. **Test for saponins:** Add 20 ml of distilled water to a small amount of each alcoholic and aqueous extract and shake the mixture in a graduated cylinder lengthwise for 15 minutes. Saponins can be spotted by a 1 cm layer of foam.
4. **Lead acetate solution test:** Mix a little quantity of the test solution with the lead acetate solution at its most basic. Tannins is indicated by the formation of white precipitates.
5. **Ferric chloride test:** Add neutral Fecl3 to the powder; the presence of phenolic compounds will cause an intense coloration to appear.
6. **Fehling's test:** Equal quantities of Fehling solutions A and B should be added to 1 ml of extract; boiling will result in the formation of a brick-red precipitate, which shows the presence of sugars.
7. **Benedict's test:** Add 1 ml of the extract solution to 5 ml of Benedict's reagent, boil for 2 minutes, and then cool. Sugars are detected because red precipitate forms.
8. **Legal's test:** Extract should be dissolved in pyridine and made alkaline by adding sodium nitroprusside solution. Pink to red color formation indicates the existence of glycoside.
9. **Millon's test:** Sulphuric acid is added to make 1 ml of the test solution acidic. Millon's reagent is then added, and the mixture is then heated. If protein is present, a yellow precipitate is formed.
10. **Ninhydrin test:** Heat the small quantity of extract solution, then add two drops of freshly prepared 0.2% ninhydrin reagent (0.1% solution in n-butanol). Proteins, peptides, or amino acids can be identified by their development of blue color.

Evaluation of herbal powder flow property

1. **Angle of repose:** Take a funnel with a 20- to 30-mm-diameter round stem and a flat tip. Under the funnel, place a sheet of graph paper. Adjust the funnel's lower tip's distance from the sheet to the appropriate height of 2 cm. Gently pour the sample into the funnel

from the top until a pile of powder forms and touches the funnel's lower tip. Draw a circle around the pile that covers about 90% of the entire powder with a pencil. Use the algorithm to determine the average diameter and radius of each drawn circle. Repeat the process three to four times to obtain an average reading.

θ= tan-1 (h/r)

2. **Determination of bulk Density & taped density:** Pour 25 g of powder (W1) in a dried graduated measuring cylinder and weigh it accurately. Write down the volume as V1 (ml). Place the sample-containing cylinder in the bulk density apparatus. Set up the equipment and start tapping 100 times. Make note of the powder's volume as V2 (ml)

Mass / Bulk volume = Bulk Density (W1 / V1 g/ml)

Mass/Tapped volume = Tapped Density (W1 / V2 g/ml)

3. **Hausner's ratio:** Flow of powder easily index is evaluated by Hausner's ratio, which is calculated using the formula

Hausner's ratio = Tap Density / Bulk Density.

4. **Carr's index:** Carr's compressibility index, which was derived using the formula, was used to determine the blend's percent compressibility.
5. **Determination of pH:** Using a pH meter, the pH of a 1% solution of powder formulation was determined.
6. **Determination of moisture content:** Three grams of powder were placed in a hot air oven set at 700 degrees for one hour to measure the amount of moisture in the powder.
7. **Determination of ash values:**

A) **Total ash value:** The precise weight of 2 g of powder was placed in a silica crucible that had already been ignited. Once it turned white, indicating a lack of carbon, the substance was ignited by progressively raising the heat to 400 0C. After cooling in a desiccator, the material's total ash is determined.

B) **Acid insoluble ash value:** To find contamination from sand or boil, use the residue left over after removing the whole ash and treating it with hydro alcoholic acid. Ash is boiled for five minutes with 25 ml of 2 m HCl, then the residue is collected on ashless filter paper, washed in hot water, ignited in desiccators, and weighed.

Table 1: Phytochemical screening.

Plant constituents	Herbal bath powder
Alkaloids	+
Saponins	-

Phenolic compounds	+
Glycosides	+
Protein & Amino acids	+
Carbohydrates	+

Table 2: Formulation of herbal bath powder.

S. No	Activity	Name of the ingredients	Color	F1	F2	F3
1.	Anti-aging agent	Turmeric	Yellow	10	15	20
2.	Nourishing agent	Almond	Creamish	10	5	15
3.	Complexion	Orange peel powder	Light yellow	15	10	10
4.	Antiaging tonner	Zeera powder	Brown	10	5	15
5.	Complexion	Masoor Dal	Red	10	15	5
6.	Exfoliating	Green gram flour	Green	15	10	5
7.	Skin whiting	Rice flour	White	10	10	15
8.	Anti-tonning agent	Gram flour	Creamish yellow	10	15	10
9.	Antioxidant	Pomegranate flour	Reddish brown	10	10	5

Table 3: Evaluation results of herbal bath powder.

S. No	Evaluation parameters	Observation		
Organoleptic evaluation		**F1**	**F2**	**F3**
1.	Appearance	Powder	Powder	Powder
2.	Color	Creamish	Light Yellowish	Yellow
3.	Odour	Astringent	Astringent	Astringent
4.	Taste	Characteristics	Characteristics	Characteristics
5.	Texture	Fine	Fine	Fine
Physicochemical evaluation				
Ash value				
6.	Total Ash	3g	3.34g	4.1g
7.	Acid insoluble ash	2.79g	2.9g	3.8g
8.	pH	7.8	7.6	7.9
9.	Moisture Content	4%	4.25%	4.9%
General powder characteristics				
10.	Particle Size	23µ	26µ	28µ
11.	Angle of repose	28.12	29.91	30.21
12.	Bulk density	0.9502g/cm2	0.6123g/cm2	0.7231g/cm2
13.	Tapped density	0.9219g/cm2	0.9931g/cm2	1.319g/cm2
14.	Irritability	No Irritation was observed	No Irritation was observed	No Irritation was observed
15.	Grittiness	When mixed with water, there were no grit particles observed.	When mixed with water, there were no grit particles observed.	When mixed with water, there were no grit particles observed.

16.	Nature of body after wash	Little softness and remove dirt from body	Little softness and remove dirt from body	Little softness and remove dirt from body

Table 4: Stability results of herbal bath powder.

S. No.	Parameters	Room temperature	At 40^0c	After 3 months
1.	Color	No change	No change	Light darkness
2.	Odour	No change	No change	No change
3.	Texture	Fine	Fine	No change
4.	Smoothness	Smooth	Smooth	No change

The antimicrobial activity

The Pharmaceutical Microbiology Laboratory, GIET School of Pharmacy, Rajahmundry, supplied the Staphylococcus aureus and Escherichia coli used in the well- diffusion, cup plate method test of dusting powder's antimicrobial activity.

Materials requirements

1. Nutritional broth (For bacterial cultivation)
2. Combine the cultures of the two microorganisms
3. Varying the trial dusting powder's concentration
4. Sterilized cork borer and Petri dishes
5. An incubator and an autoclave

Well- diffusion using cup plate method: The agar media was autoclaved. After inoculums had been added to 250 ml of the media under aseptic conditions, it was poured into Petri plates. Once the mixture had solidified, wells were drilled using a sterile borer.

Sample preparation: One gram of powder was dissolved in distilled water until a solution was formed. The solution was then thoroughly poured into each plate's bores. The labelled wells were incubated at 32–370C for 48 hours in a clockwise direction. Clear zones of inhibition surrounding the well served as indicators of the test organism's sensitivity to each antibacterial agent.

Statistical evaluation

The diameter of the zone of inhibition was used to measure the antimicrobial activity.

Table 5: Stability results of herbal bath powder.

Antimicrobial activity			
S. No		***Staphylococcus aureus acne***	***E. coli***
1.	Ciprofloxacin	10	08
2.	Herbal bath powder	6	3

RESULTS AND DISCUSSION

For general and organoleptic powder, the evaluation results are given in a table. The study of the composition, color, flavors, texture, ash content, moisture content, and pH of the combined dried powders under investigation led directly to the key characteristics of organoleptic and physiochemical evaluation. There is Creamish (F1), light yellowish (F2), and yellowish coloration (F3). Astringent odour; fine powdery texture. It was determined that ash was present in the combined dried powder upon evaluation for total ash yield.

The value of a moisture content was discovered to be between 4% and 5%. The dried powder of the formulation was calculated by making a 1% dispersion of powder in distilled water and checking the pH with a pH meter. A 1% dispersion of powder had a pH between 7.8 and 7.12, which showed that the combined powder form was mildly alkaline in composition. The evaluation of dried powder in mixed form produced the following findings: Particle size is between 23 and 28, angle of repose is between 28 and 30, bulk density is between 0.59 and 0.72 g/cc, and tapped density is between 0.92 and 1.3 g/cc. During irritancy testing, the formulation showed no signs of irritation, redness, or swelling and was simple to wash off with water. The powder flows smoothly and satisfactorily for a bath powder. Staphylococcus aureus acne and E. coli were the two species used in the antimicrobial assessment. A formulation and microbial load were also discovered. The formulation's stability tests show that, save from pH, there has been no change in the formulation's color, smell, texture, or smoothness. The stability studies showed that the pH of the formulations slightly changed at 40 0C.

CONCLUSION

Natural and herbal cosmetics both have similar meanings. The use of herbs in their raw or extracted forms is what distinguishes herbal cosmetics from other products. The base of herbal cosmetics is made from substances that are legal to use in cosmetics, and one or more herbal ingredients are added to cure various skin problems and enhance beauty. A good, practical way to improve utilization as a herbal bath powder is to create a concept of herbal bath powder that consists of many herbal powders. According to the results of the trials, the

powder can promote skin whitening and remove grime. It is possible to do additional research on the created herbal bath powder.

Fig. 1: Bath powder.

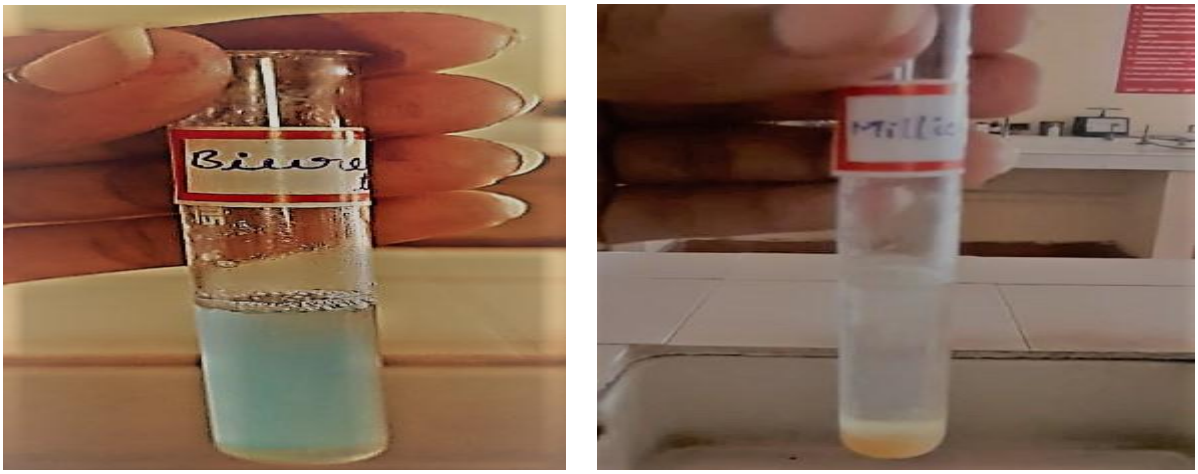
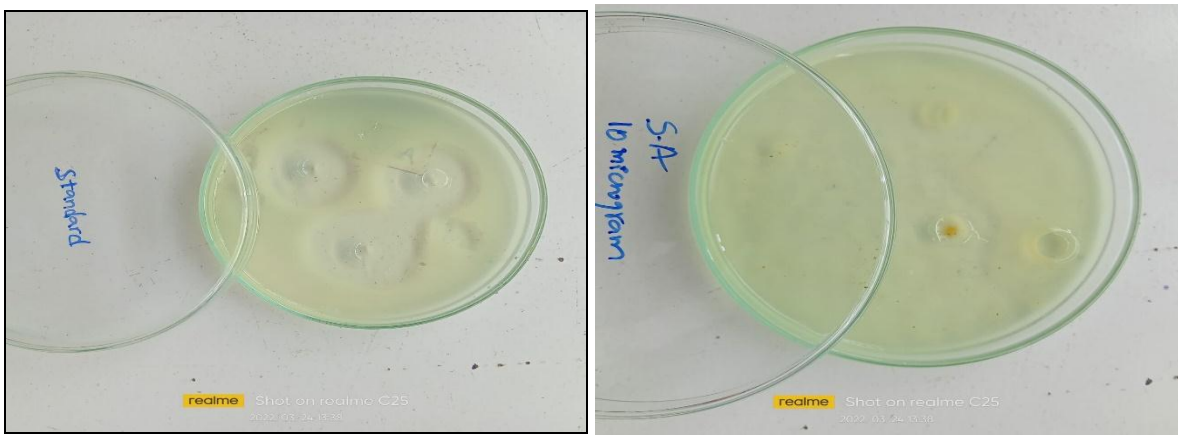
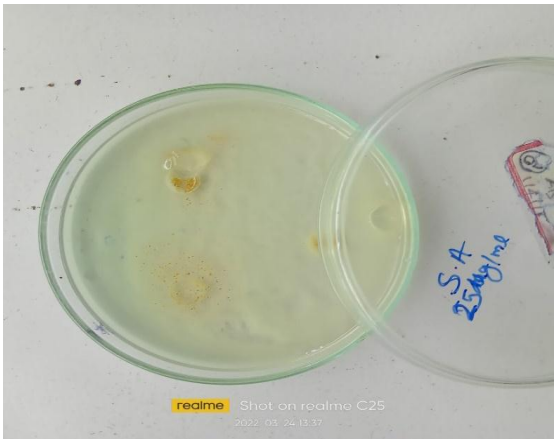


Fig. 2: Protein tests.





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