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FORMULATION AND EVALUATION OF HERBAL SHAMPOO

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ABSTRACT

The study's primary objective is o lessen hair loss and encourage hair growth because it is now the most prevalent and serious condition. Fermented rice water (Oryza Sativa), which contains substantially more antioxidants than pure rice water, is the key component of this study. Antioxidant in rice water called inositol helps stop hair loss. Traditional herbs such as Hibiscus rosasinensis, Sapindus mukorossi, Aloe Vera, Senegalia rugata, Phyllanthus emblica, and fermented rice water were used to make the herbal shampoo, which was tested on a number of parameters. According to research, herbal shampoo has a variety of qualities, including excellent foaming ability, effective washing, low surface tension, viscosity, and soothing effects, as well as being biodegradable and environmentally friendly. The assessment of the effects of the herbal shampoo were more pronounced and it is safe, effective, and efficient at treating hair loss.

Keywords: Herbal shampoo, Oryza Sativa, Hibiscus Powder, Hair Fall, Detergency power, Biodegerdable. etc.

1. INTRODUCTION

Herbal shampoo is a cosmetic product made from age-old ayurvedic herbs that is used to clean the hair and scalp. Shampoo is a product used to wash hair, and it comes in a thick liquid form. The goal of shampoo is to eliminate dirt, stop hair loss, and remove unwanted buildup between the hairs without removing too much sebum that makes the hair difficult to manage. The most common hair treatment is shampooing. Although the majority of shampoos on the market today are surfactant-based, shampoos can be made using herbs and their extracts. Surfactants are included for their cleansing abilities, but prolonged use of them can harm hair, cause eye irritation, and result in hair loss and dryness. [1] In order to make hair silky, lustrous, strong, and conditioning as well as to boost thestrength, texture, and growth of hair, this study employed a herbal shampoo formulated with Hibiscus-rosasinensis, Embalica officinalis, Trigonella foenum graceum, Aloe barbadensis, and fermented rice water. Fermented rice water is rich in inositol, an antioxidant that is helpful for the health of your hair. Inositol, a component of rice water, has the power to penetrate damaged hair and rebuild it from the inside out while also preventing thinning. The perfect pH of fermented rice water keeps hair healthy and shiny, improves skin elasticity, lessens surface friction, and prevents greying of the hair. Vitamins B6 and B12 are abundant in it.There are numerous medicinal herbs that have been found to have positive effects on hair and are widely utilized in Shampoo composition. These plant products can be powdered, crude, pure extracts, or derivatives. It's Very Difficult to make an herbal shampoo by using only one natural ingredient that's milder and safer than synthetics while yet Competing favorably in terms of foaming, detergency, and solid content. As per result, we decided to prepare a pure herbal Shampoo using plant parts and material that have been used for hair cleaning in shampoo.

Need of shampoo :

A. The skin on our head produce agreasy fluid called sebum . It is produced to protect the hair from sebum.
B. This give the hair a healthy shine .
C. Eliminate extra oil .

Ideal properties of herbal shampoo:

A. The corneal cells from he hair should be removed , along with any excess sebum or other fatty substances .
B. It should generate enough foam to meet the psychological needs of the user.
C. It should be simple to remove after water rinsing .
D. It gives the hair a lovely fragrance .

2. OBJECTIVE

- Calculate the quantity of fermented rice water required to smooth the scalp and hair of people
- Find out how well the nutrients in fermented rice water can penetrate the harm done to human hair and scalp.
- Evaluate the possibility of making shampoo for human hair from fermented rice water.
- To create a herbal shampoo to prevent hair loss.
- To evaluate the natural shampoo.
- To lessen the damaging effects of chemical formulations on hair and to prevent hair loss.
- To strengthen and promote hair growth.

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Functions of Shampoo

- It must effectively and thoroughly remove dirt.
- The hair must be thoroughly cleaned.
- It ought to produce enough foam to make the user feel comfortable.
- The dirt should be easily removed by rinsing with water.

Advantages of Herbal Shampoo

- Cheaper and easier to produce.
- Easily accessible, plentiful, and found in a wide variety
- They had no unfavourable side effects and neither promoted nor caused allergic reactions
- Simple to integrate into the skin and hair.
- Used herbal resources are pure and organic.
- No API or ingredients derived from petroleum.

Disadvantages of Herbal Shampoo

- Sometimes it's challenging to cover up taste and odour.
- Because herbal medicines work more slowly than allopathic ones, prolonged treatment is necessary.
- The manufacturing process is laborious and complex.
- Vary from batch to batch in consistency.

Types OF SHAMPOOS- Shampoos are of following types Based on function

- Clear liquid shampoo
- Powder shampoo
- Lotion shampoo
- Medicated shampoo
- Solid gel shampoo
- Liquid herbal shampoo Specialized shampoo
- Anti-dandruff shampoo
- Baby shampoo
- Two-layer shampoo

DESCRIPTION: Take one cup of rice (any variety would do), rinse it, and then drain the water. Now let the rice soak for 20 minutes in two cups of distilled water, stirring every five minutes. Transfer the water to a clean bottle, strain it, and leave it overnight. It should have started to ferment and go sour in the morning. It is said to help the hair grow more quickly and make it lustrous and silky. Starch makes around 75-80% of rice grains. The essential proteins and keratin in our hair can be replaced with the aid of fermented rice water. Fermented rice water is rich in minerals and vitamins B, C, and E. It has a PH of about 6, which is somewhat acidic.

Benefit of fermented rice water:

1. Fermented rice water for hair strength: Use Fermented rice water for hair if you want strong, healthy hair. The rice water's amino acids fortify the hair roots. Additionally, it contains inositol, an antioxidant that gives the hair strength. It is simple to detangle hair using fermented rice water, which reduces hair breakage and nourishes hair.
2. Hair-care with fermented rice water sparkle, smoothness, and shine: Fermented rice water can be used to give hair a shiny, full-of-lustrous appearance. The added layer of defence provided by fermented rice water is particularly effective against air pollution and dirt, heat-producing electronic hair appliances, chemicals in hair care products, etc. These cause the hair to lose its sheen, while the fermented rice water makes sure that it stays silky, smooth, and shining. A natural conditioner that provides the hair fantastic bounce is fermented rice water
3. Rice water fermented for hair growth: The fact that fermented rice water promotes hair growth and prevents hair loss—and that you can notice the rise in just a short period of time—is another crucial factor. The hair remains healthy as the fermented rice water helps shield it from harm. The fermented rice water's protein, vitamin, and antioxidant boost to the hair promotes rapid hair growth.
4. Fermented rice water for dandruff : The growth of Malassezia, a fungus that can cause dandruff, is inhibited by fermented rice water, particularly that made from red rice. Therefore, treating hair with fermented rice water will solve the dandruff issue. It manifests the antifungal properties. Additionally, it moisturises the hair and scalp, preventing dry skin, which leads to skin flaking, from developing. Weekly application of fermented rice water to the hair will prevent flakes and dandruff.

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5. It is chemical free hair: Using it as a shampoo to wash out your hair may not be as convenient as a store bought shampoo, but it comes without chemicals and preservatives, and you don't even need to follow it up with a conditioner

Information of rice plant:

Name of the plant: Oryza sativa

Biological source: made up of the endosperm and embryo of Oryza sativa seeds.

Family: Poaceae/Graminae

Classification in science:

Kingdom: Plantae – plants, plants, planta, and vegetation Viridiplantae, a subkingdom of green plants Embryophyta is a super division. Tracheophyta, which includes tracheophytes and vascular plants Spermatophytina, or spermatophytes, are the division. Magnoliopsida, a class Poaceae/Graminae, which includes grasses and graminées Rice species: Oryza L. Species: rice, Oryza sativa L.

Chemical composition: A full complement of amino acids, 12% water, 75%–80% starch (carbohydrate), 7% protein, 3% fat, and 3% fibre make up a rice grain's chemical make-up.

Drug -related activity: Antihairfall Antioxidant, antifungal, anti-colitis, cancer-preventive, anti-tumor, anti-mutagenic, antidiabetic, ocular impairment, anti-aging, and anti-inflammatory. Vitamin B, C, E, and minerals included in fermented rice water support skin cell growth.

6. MATERIALS AND METHEOD

Table 1: formulation table

Sr. no	Name of ingredinets	F1	F2	F3	F4	F5	F6
1	Rice water [ml]	15	20	25	30	35	40
2	Hisbiscus powder [gm]	0.4	1	1.4	2	2.4	3
3	powder [gm]	0.4	1	1.4	2	2.4	3
4	Alovera gel [gm]	0.4	1	1.4	2	2.4	3
5	Reetha powder [gm]	0.4	1	1.4	2	2.4	3
6	Shikakai powder [gm]	0.4	1	1.4	2	2.4	3
7	Vit.E [gm]	0.4	1	1.4	2	2.4	3
8	Shampoo base [q.s]	0.4	1	1.4	2	2.4	3

Preparation of herbal shampoo:

- Place cup of rice in a clean bowl and give it a quick rinse under the faucet to get rid of any dirt or impurities. added more water to the rice once more after draining the water, and I covered the bowl with a sturdy lid. About a day, set the bowl aside at room temperature After collecting the rice water, put it in a clean glass jar and let it ferment for two to three days.
- To the collected fermented rice water, add the vitamin E, aloe vera gel, hibiscus powder, amla powder, reetha powder, shikakai powder, and stir until they are evenly distributed.
- Formulation was now filtered.
- The filtered formulation was infused into the shampoo base until the desired viscosity was reached.

Table 2 . information of ingredients.

Sr.no	Common name	Botanical name	Part of plant	Category
1	Fermented rice water	Oryza sativa	seed	Stimulating hair growth
2	Fenugreek	Trigonella foenumgraecum	Seed	Antidandruff
3	Hibiscus	Hibiscus rosasinesis	Flower	Conditioning agent
4	Aloe vera	Aloevera	Leaf	Conditioning agent
5	Reetha	Sapindus mukorossi	Fruit	Controlling hairfall
6	Shikakai	Senegalia rugata	Seed	Controlling hairfall

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Evaluation criteria: A number of quality control tests were carried out to evaluate the formulation of shampoo.

1. Physical appearance:

   By looking at the shampoo with the unaided eye, physical qualities like colour, clarity, and odour were assessed.

2. Calculation of pH:

   Using a pH analyzer, the pH of the herbal shampoo made from fermented rice water was determined.

3. To test for dirt dispersion:

   10 ml of distilled water was added to two drops of specially formulated herbal shampoo in a wide-mouthed test tube. One drop of Indian ink was put to the test tube, and the test tube's mouth was sealed while it was shook for ten minutes. Test tube ink volume was measured, and the outcome was assessed in terms of heavy

4. Wetting test:

   A disc with a 1inch diameter was cut from a 0.45 g canvas paper. Put it on the shampoo solution's surface. With the aid of a stop watch, note how long it takes the paper to absorb the formulation.

5. Surface tension test :

   The surface tension of the prepared herbal shampoo in pure water (10% w/v) was measured using a stalagmometer at room temperature.

   Formula was used to arrive at the result: R2/R1 = w3-w1(n1)/w2-w1(n2) W1= weight of empty beaker W2= weight of beaker with distilled water W3= weight of beaker with herbal shampoo n1=number of drops of distilled water n2 =number of drops of shampoo solution R1= surface tension of distilled water at room temperature R2= surface tension of shampoo solution.

6. Determination of solid content:

   Place approximately 4g of shampoo solution in an evaporating dish. By setting the dish on a hotplate, the prepared shampoo's liquid component evaporated. After the dish had dried completely, the amount of solid material left in it was calculated. It was determined by using the formula; % of solid content = C-A / B-A x 100 Where; A= weight of empty evaporating dish B= weight of evaporating dish with shampoo solution C= weight of evaporating dish after evaporation of shampoo solution

7. Rheological:

   Using a Brookfield viscometer, the viscosity of the herbal shampoos was assessed. Spindle was submerged in 10ml of shampoo for roughly five minutes before readings were obtained.

8. Detergency ability:

   The effectiveness of the herbal shampoo samples was assessed using the Thompson method. In a nutshell, a clump of hair washed in a 5% sodium lauryl sulphate (SLS) solution, dried, and split into 3g weight of groups. The samples were shaken for 15 minutes at room temperature while being suspended in a 10% fake sebum solution in hexane. Following sample removal, the solvent was at room temperature evaporated, and the sebum content was calculated. The following procedure involved splitting each sample into two equal halves, one of which rinsed with 0.1 ml of the 10% test shampoo and was used as the negative control. After drying, samples' remaining sebum was removed using 20 ml of n-hexane, and the samples were then reweighed. Finally, the percentage of detergency power was calculated using the following equation: DP=100(1-T/C) In which, DP is the percentage of detergency power, C is the weight of sebum in the control sample and T is the weight of sebum in the test sample .

9. Phytochemical analysis of fermented rice water:

   To determine the existence of bioactive chemical elements such alkaloids, flavonoids, glycosides, steroids, phenols, tannins, and proteins, qualitative phytochemical tests were carried out.

Table 3 Result and Dicussion.

Sr.no	Evaluation parameter	Observation F1	F2	F3	F4	F5	F6
1	Colour	Brown	Brown	brown	Dark brown	Dark brown	Dark brown
2	Odour	Characteristic	Characteristic	characteristic	characteristic	characteristic	characteristic
3	Appearance	Viscous	Viscous	Viscous	Viscous	Viscous	Viscous
4	PH	8.4	8.2	7.4	6.9	6.3	5.4

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5	DIRT DISPERSION	medium	Medium	medium	None	None	None
6	Foaming index	30	36	40	49	55	70
7	Wetting test	95	115	118	128	142	158
8	%of solid content	15	18	21	24	28	35
9	Surface tension	22.60	28.44	33.33	36.4	41.24	43.52

Physical appearance: The shampoo formulation was evaluated for visual examination. The shampoo formulation was found to be clear, dark brown, and odourless.

Ph: The shampoo's pH Is crucial for stabilising the scalp, enhancing hair quality, and minimising eye discomfort. Most shampoos are made with either a neutral or slightly acidic pH to reduce damage to hair. The pH of the herbal shampoo formulation was determined to be between 5.4 and 8.4.

Determination of solid content: Generally speaking, a high-quality shampoo needs to have a solid content of 20% to 30% in order to be simple to apply and remove.

It is quite challenging to wash off if the solid concentration is higher. The solid percentage of the herbal shampoo formulation was discovered to be between 15% and 35%.

Foaming ability and stability: One of the crucial factors to take into account while evaluating shampoos is foaming power. The designed herbal shampoo's foam volume was discovered to be between 30 and 70 millilitres. Even after observing for 4 minutes, this volume had not changed.

Dirt dispersion: The dirt dispersion test is quite important for assessing the cleansing effect of shampoo. If the ink concentrates in the froth of the shampoo, it is deemed to be of low quality.

The outcomes were classified as heavy, moderate, light, or none based on the ink concentration in the foam.

Wetting time:

Wetting time tests are performed to evaluate the shampoo's effectiveness. It depends on the surfactant concentration. The preferred approach for determining the wetting time is the canvas disc method. The designed shampoo's wetting time was discovered to be between 95 and 158 seconds.

Surface tension: Based on the surface tension readings, the detergency of the shampoo can be calculated. The surface tension value must be lower for the shampoo's cleaning power to increase. The surface tension of the herbal shampoo formulation was discovered to be between 22.60 and 43.52 dynes/cm.

7. CONCLUSION

In order to lessen hair loss and encourage hair growth, fermented rice water herbal shampoo was created. Traditional herbs, herb extract, and fermented rice water were used to create a herbal shampoo that is very safe and effective to use. Inositol, a significant chemical component found in rice water, is important for minimising hair damage when receiving the keratin treatment since it supports the hair root and encourages hair growth. Additionally, several plants that work well as conditioning agents and antifungal agents are employed.

Contrary to the use of synthetic conditioning agents, the use of natural conditioning agents aids in reducing moisture on the skin's surface and hair loss.

Various metrics, including wetting time, visual inspection, foaming index, pH, filth dispersion, percentage of solid content, and surface tension, were used to evaluate laterformulated herbal shampoo.

It was determined that formulation F4 has produced superior outcomes than other formulations based on the evaluation results of different formulations. In comparison to other formulations, the herbal shampoo made from fermented rice water helps to prevent hair loss, encourage hair growth, and keep hair strong.

Consequently, the herbal shampoo made from fermented rice water proved safe to use and aids in preventing hair loss. The aqueous extract of medicinal herbs that are frequently used for hair washing traditionally was employed in the formulation of fermented rice water herbal shampoo. Instead of synthetic materials, the current study uses fermented rice water, hibiscus flower, aloe vera leaf, fruit of reetha, and shikakai and amla seeds to deliver the positive results.

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