



FORMULATION AND COMPETITIVE EVALUATION OF FERMENTED RICE WATER SHAMPOO WITH MARKETED PRODUCT

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ABSTRACT

Now-a-days, the most occurring problem is hair fall, so the main aim of the study is to reduce hair fall and promote hair growth. The main ingredient in this study is fermented rice water (*Oryza sativa*) which contains many antioxidants when compared to the plain rice water. The herbal shampoo was formulated using some of the traditional herbs like *Hibiscus-rosa-sinensis*, *Aloe vera* along with fermented rice water in different concentrations and evaluated for various parameters. The evaluation results of the herbal shampoo had shown better results, which is ideal to use, safe and effective in the treatment of hair.

Keywords: Hair growth, *Aloe vera*, *Oryza sativa*.

INTRODUCTION

Herbal shampoo is a cosmetic product made from age-old ayurvedic herbs that is used to clean the hair and scalp. Hair is simple in structure, but has important functions in social functioning. Hair is made of a tough protein called keratin. A hair follicle anchors each hair into the skin. The hair bulb forms the base of the hair follicle. In the hair bulb, living cells divide and grow to build the hair shaft. Blood vessels nourish the cells in the hair bulb, and deliver hormones that modify hair growth and structure at different times of life. In the present study, herbal shampoo was formulated by using the ingredients such as *Hibiscus-rosa sinensis*, *Embllica officinalis*, *Trigonella foenumgraecum*, *Aloe-barbadensis* and fermented rice water makes hair smooth and shiny and as well as it improves the strength, texture and growth of hair.

Fermented rice water is found to have vitamins B, C, E and contains a lot of minerals which are very important for your hair growth. It provides nourishment to your hair and improves their overall health too. 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. According to a 2010 study published in the International Journal of Cosmetic Science, utilising fermented rice water as a hair treatment has various advantages, including enhanced elasticity, the prevention of hair loss, a smoother texture, less friction, and less frizz.

MATERIALS AND METHODS**PREPARATION OF FERMENTED RICE WATER**

Taken a cup of rice in a clean bowl and rinsed with water for once to remove the dirt and impurities. Drained the water and again added some amount of water to rice and covered the bowl with heavy lid. Kept the bowl aside at room temperature for a day. Later, collected the rice water and transferred into a clean glass jar and allow it to ferment for 2 to 3 days.

PREPARATION OF HIBISCUS EXTRACT

Take petals of hibiscus. Place it in hot air oven for drying at 90degree Celsius for 20 minutes. After complete drying crush the petals in mortar pestle to make fine powder. Pass through sieve then dissolve into 50ml ethanol and put in sonicator for 15minute and 40°c.

Sr.no	ingredients	category	percentage	Quantity (gm/ml)
1	Fermented rice water	Solvent	80.00%	200ml
2	Glycerin	Humectant	0.50%	1.25ml
3	Aloe vera	Conditioning agent	4.2%	10ml
4	Hibiscus extract	Anti-dandruff	0.30%	0.15ml
5	Glycerol monostearate	Surfactant	14,50%	30.25gm
6	Honey	Preservative	0.30%	0.15ml
7	Castor oil	Thickening agent	2.50%	6.25ml
8	Fenugreek powder	Foaming agent	0.60%	1.50gm

PREPARATION OF SHAMPOO

1. Take fenugreek powder in mortar pestle. Triturate it for well texture.
2. Add glycerin into it and mix it well.
3. Add aloe Vera by continue triturating to avoid lumps in aloe Vera.
4. Add lemon oil. Add hibiscus extract into it step by step
5. Melt the glycerol monostearate in electric water bath.
6. Add melted glycerol monostearate into by with continue triturating.
7. To avoid lumps so keep triturating while adding glycerol monostearate.
8. Add rice water step by step. Simultaneously add honey. Honey helps to avoid lumps during formulation. Add castor oil as a thickening agent.

Sr.no	Ingredients	F1	F2	F3
1	Fermented rice water	q.s	q.s	200ml
2	Glycerin	1ml	1ml	1.25ml
3	Aloe vera	10ml	q.s	10ml
4	Lemon oil	1ml	1ml	1ml
5	Hibiscus extract	1ml	1ml	0.15ml
6	Glycerol monostearate	-	3gm	30.25gm
7	Honey	2ml	2ml	0.15ml
8	Castor oil	6ml	6ml	6.25ml
9	Fenugreek powder	4gm	4gm	1.50gm
10	Citric acid	-	1ml	-

Evaluation of formulated and marketed shampoo

A number of quality control tests were performed to evaluate formulation of shampoo

1. Physical Appearance:

The formulated shampoo was evaluated for physical characteristics such as transparency, color, odor by observing with naked eye.

2. pH determination:

The pH of the fermented rice water shampoo was evaluated by taking (10% v/v) solution by using pH analyzer.

3. Test for dirt dispersion:

Two drops of formulated shampoo were added to 10 ml of distilled water which is taken in a wide mouthed test tube. To the test tube one drop of Indian ink was added and the test tube was shaken for 10 min by closing the test tube mouth. Volume of ink in the test tube was measured result was graded in terms of heavy, medium, none.

4. Foaming ability:

50 ml of formulated shampoo taken in a test tube volume of 250 ml, shake the test tube for 10 times with time period of 1min, 4min respectively. Total foam was measured after 1min of shaking. The method called as cylinder shake method.

5. Wettability test:

A canvas paper weighing 0.44 g was cut into a disc diameter measuring 1 inch. Place it in the surface of the shampoo solution. Record the time taken by the paper to sink in the formulation and record the time by using stop watch.

6. Stability test:

Store the shampoo in different conditions (e.g. variety of temperature conditions) to check stability of shampoo.

7. Solubility test:

Dissolve some amount of shampoo in water to check solubility of shampoo.

8. Consistency test:

It is depend on shampoo texture how easy to apply it on scalp.

9. Packaging evaluation:

This test checks the liquid holding capacity of container and stability of formulation.

RESULT AND DISCUSSION**pH:**

To minimize the damage to hair, most of the shampoos are formulated either with neutral or slightly acidic pH. The pH of the formulated herbal shampoo and marketed shampoo was found to be in the range of 5 to 6.

Physical appearance:

The formulated shampoo was assessed for visual inspection. It was observed that the formulated shampoo was bone white in color, and marketed was cloudy white in color.

Foaming ability:

The foam volume of the formulated and marketed herbal shampoo was found to be in the range of 4 to 6.

Dirt dispersion:

For the evaluation of the cleansing action of shampoo, dirt dispersion test plays an immense role. Shampoos are considered of poor quality, if the ink concentrates in the foam. Based on the concentration of the ink in the foam, the results were declared are medium for formulated and marketed shampoo.

Wettability test:

It depends upon the concentration of surfactant. The canvas disc method is preferred for calculating the wetting time. The wetting time of the formulated and marketed shampoo were found to be in the range 6 to 9 second.

Leakage test:

In order to check the leakage of container by putting the formulation in container and place it vertically downward shows the leakage of container.

Sr. No.	Tests	Formulated shampoo	Marketed shampoo
1	pH	5	6
2	Color and clarity	Bone white (absent)	Cloud white (cloudy)
3	Foaming ability	4cm	6cm
4	Stability test	present	Present
5	Odor	fermented	Sweet
6	Solubility test	Soluble in water	Soluble in water
7	Leakage test	Dose not leak	Does not leak
8	Wettability test	6 sec	4 sec
9	Consistency test	thick	Slightly thick
10	Dirt dispersion	medium	medium

CONCLUSION

Herbal shampoo with high cleansing and foaming ability was formulated using natural herbs and herbal extract. This formulation is rich with nutritional agent that have anti dandruff, conditioning and thickening property. Inositol a chemical constituent present in rice water plays a key role in preventing hair damage provide support to hair strength and helpful for their growth. It was concluded that formulation F3 has shown better result. A need for this age is to prepare herbal cosmetic which will prove beneficial and lesser side effect. This will boost to use of natural medicine in coming era. However the formulated shampoo shows good rheological properties and quite comparable with its marketed counter parts, but its detergent and cleansing property was found somewhat less in comparison to marketed product.

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