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## Formulation and evaluation of flaxshine hair conditioning mask

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### Abstract

Now a days natural remedies are used in more likely in all over world because of their safe and less side effects compared to chemical-based product. There are various hair care herbal cosmetics available in market but showing problems like greasiness, scalp irritation, lack of deep repair, use of harsh and heavy ingredients not able to satisfy customer need. Now a days youth focus for strong, shiny hairs and frizzy removal formulation. Goal of this research is to formulate and evaluate hair conditioning mask using natural ingredients like flax seeds, rice water and vitamin E offer a promising effects like antioxidant, antidandruff, and strengthening properties of these ingredients and overcome all the problems like hair loss, dry, frizzy, dull hair, dandruff and to achieve healthy hairs on the way to satisfy customer demand. Developed hair conditioning mask was evaluated for viscosity, spreadability, Extrudability, skin irritancy, stability study and various physicochemical test.

**Keywords:** Hair conditioning mask, flaxseed, rice water, antioxidant, antidandruff, strengthening

### Introduction

Hair is a crucial part of the human body, which protects the scalp. Hair conditioning mask is a hair care product that is applied after shampooing in order to condition the hair <sup>[1-2]</sup>. Hair conditioning mask act to work by overcoming most of the hair problems like hair loss, dry hair, frizzy hair, dull hair and dandruff, greasiness, scalp irritation, lack of deep repair<sup>[3]</sup>. Mask for hair is formulated to provide deep conditioning, deep repair, nourishment, and repair the hair, making it softer, smoother, and more manageable. It is recommended to use a hair mask once a week or twice a week as per damage of hairs. The exceptional blend of five-star complex flaxseed gel, Vitamin E, citric acid, rice water, glycerin used in the formulation <sup>[4-10]</sup>. Flaxseeds is an important functional food component, because of its rich contents of  $\alpha$ -linolenic acid (ALA), omega-3 fatty acid, fiber and lignans. Alpha-linolenic acid is another type of omega-3 fatty acid found in plants.  $\alpha$ -Linolenic acid helps in lightening hyperpigmentation by suppressing melanin production<sup>[11-12]</sup>. Alpha linoleic acid shows anti-inflammatory property and it provides aliment and nutrient to scalp. In flaxseed oil, flax and fibers, lignans have shown implicit health benefits such as reduction of cardiac complaint, atherosclerosis, diabetes, cancer, arthritis, osteoporosis, autoimmune and neurological diseases. Flaxseed also contain fatty acids and antioxidants which help to remove toxins and dead cells from the scalp. Antioxidant produces by flaxseed is lignans. Lignans have the potential to suppress or inhibit bacterial growth and may also play a role in cancer prevention <sup>[13]</sup>.

Flax seed gel can be applied to scalp and hair as moisturizer that can help to stimulate hair growth and improve the strength of hair. Flaxseed benefits for skin and hair including strengthen the origins of hair which reduce hair fall. Flaxseeds yield an oil commonly known as linseed oil <sup>[14]</sup>. Flaxseed hair mask is natural herbal product which is help in nourishing the hair and shows anti-dandruff and hair growing effect. Flaxseed hair gel is made by simple boiling procedure, so it is less in cost and easy to handle. Flaxseed hair gel eliminates a dandruff useful for the hair shine, smooth, Luster, hair Strength, also use as chemical free hair cleanser and maintain the pH of the scalp <sup>[15]</sup>. Rice water having ability to promote hair growth and deep hydration, it helps to protect the hair from damage and the hair remains healthy. The protein in rice water gives to the hair helps it grow fast. It also helps to promote skin cell growth, stimulates blood flow, and slows down the aging process of hairs <sup>[16-17]</sup>.

### Materials

Flaxseed, Rice water, Vitamin E, Carbopol, Citric acid, Polyethylene glycol (PEG), Polyvinylpyrrolidone (PVP), Triethanolamine, Glycerine, Rose oil, Distilled water.

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## Methodology

### Preparation of flax seed extract

Flax seed extract was prepared by using 50 g of flax seed in beaker, then add 250 mL rice water to it and boiled it with constant stirring until a thick mucilage was obtained. Mucilage was strained using sieve and stored at room temperature until further use.



**Fig 1:** Flaxseed



**Fig 2:** Rice Water



**Fig 3:** Vitamin-E

### Preparation of hair mask base

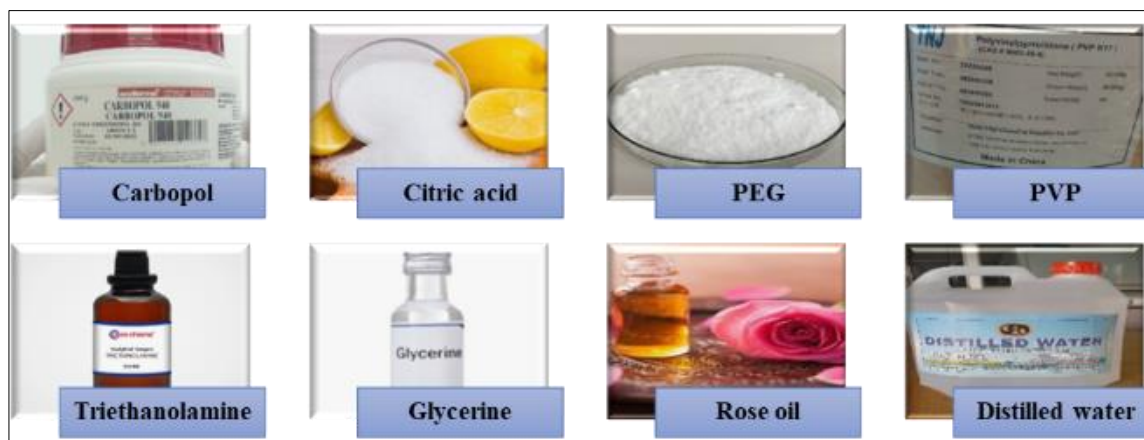
Weighed quantity of polyethylene glycol and measured quantity of glycerine and citric acid were dissolved in 35 mL of water in 250 mL beaker. Then mixture was stirred using magnetic stirrer at high speed. Carbopol and PVP were added slowly to the beaker containing above mixture of liquid with continuous stirring until gel structure was obtained.

### Preparation of hair conditioning mask

The flax seed extract was slowly added into the beaker containing hair mask base with continuous stirring until the final formulation was prepared.

**Table 1:** Trial formulation batches

| Ingredients     | F1     | F2     | F3     |
|-----------------|--------|--------|--------|
| Flax Seed Gel   | 50 mL  | 50 mL  | 50 mL  |
| Rice Water      | 250 mL | 250 mL | 250 mL |
| Vitamin E       | 1 mL   | 1 mL   | 1 mL   |
| Carbopol        | 0.3 g  | 0.5    | 0.7 g  |
| Citric acid     | 0.1    | 0.1    | 0.1    |
| PEG             | 6.25   | 6.25   | 6.25   |
| PVP             | 5      | 5      | 5      |
| Triethanolamine | 0.5    | 0.5    | 0.5    |
| Glycerine       | 3      | 3      | 3      |
| Rose oil        | q. s.  | q. s.  | q. s.  |
| Distilled water | 35 ml  | 35 ml  | 35 ml  |



**Fig 4:** Remaining formulation ingredients

## Evaluation of herbal hair conditioning mask



Fig 5: Optimized F2 formulation

### Physical properties

Herbal hair conditioning mask was translucent which was found to be smooth on application.

### Homogeneity and Texture

It was tested by pressing a small quantity of formulated hair mask between thumb and index figure.

### Washability

washability test was performed on hair strand.

### Determination of pH

Digital pH meter is used to determine the pH of hair mask. A pH reading is made by dipping an electrode into the appropriate gel formulation after 1 gm of hair mask has been dissolve in 100 ml of distilled water and left to stand for two hours.

### Extrudability

Small amount of mask was taken into a collapsible ointment tube. One end closed and the other end kept opened. Pressure was applied on the closed side. The time taken to extrude and the amount of mask extruded was noted.

### Skin irritation test

The hair conditioning mask can be used sparingly and left on the skin for a short time and found to be non-irritant.

### Spreadability

Keeping 1 gm sample between two transparent glass slides. The standard weight applied on upper slide glass. It is calculated

$$S = m \times L / t$$

### Were;

- S- Spreadability
- m- Weight on slide (1gm)
- t- Time taken in sec (20sec)
- L- Length of glass slide (7.4)

**Viscosity determination:** The viscosity was determined by using Brookfield viscometer. Spindle was used for calculating the viscosity of this formulation. The hair mask was filled in wide mouth container for better measurement of viscosity. The rpm of the spindle is adjusted to 25 rpm and viscosity was recorded. The viscosity of the preparation was found in the range.

**Stability studies:** Stability studies were evaluated for the formulation for a period of 3 months. No changes were found for the tested parameters like appearance, pH, extrudability and spreadability at different temperature. The stability studies are mentioned in table.

### Result and Discussion

**Physical properties:** Colour of the hair conditioning mask found to be greyish white with translucent appearance which was found to be smooth on application.

**Homogeneity and Texture:** Formulated mask was check for presence of any flocculated and lumps. Homogeneity of hair mask was found to be excellent.

**Washability:** Little quantity of hair conditioning mask was applied over the hair strand and washed with water. It was easily washable.

### Determination of pH

The measurement of pH of the hair mask were done and it was observed that the pH of formulation F1 to F3 was found to be in the range of 6.2 to 7.1 From the values of pH, it is concluded that the hair conditioning mask was compatible with hair.

Table 2: pH

| Batches | F1  | F2  | F3  |
|---------|-----|-----|-----|
| pH      | 6.3 | 6.7 | 7.1 |

### Extrudability

Flaxshine hair mask showed good extrudability when the mask extruded from metallic collapsible tube. The mask had excellent extrudability.

### Skin irritation test

Little quantity of hair conditioning mask was applied over skin through patch test and no irritation was occurred.

### Spreadability

Spreadability of the mask was found to be within the range of 19.04 to 21.74 g.cm/sec. marketed product spreadability was determined to be 20.61 g.cm/sec. Based on these observations, the spreadability of F2 batch was considered to be good result.

**Fig 6:** Spreadability apparatus**Table 3:** Spreadability

| Batches                  | F1    | F2    | F3    |
|--------------------------|-------|-------|-------|
| Spreadability (g.cm/sec) | 19.04 | 20.24 | 21.74 |

**Viscosity determination:** Viscosity of the hair mask formulation was found in the range of 15034 to 15376 cps. From the result it is clear that as the concentration of the Carbopol increase the viscosity of the hair mask increased. The result is mentioned in table.

**Table 4:** Viscosity

| Batches          | F1    | F2    | F3    |
|------------------|-------|-------|-------|
| Viscosity (cps.) | 15034 | 15201 | 15376 |

**Stability study:** Stability study were conducted for the formulation for a period of 3 months no appreciable changes were found for the tested parameters like appearance, color, pH, extrudability and spreadability at both temperatures (room temperature and 40 °C). The result is tabulated in table. The result of stability study is even unchanged after 3 months is shown.

**Table 5:** Stability study

| Sr. No. | Parameters               | Initial              | First month          | Observations         | Second month         | Third month          |                      |                      |
|---------|--------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|         |                          |                      | RT                   | 40                   | RT                   | 40                   | RT                   | 40                   |
| 1.      | Apperance                | Translucent & smooth | Translucent & smooth | Translucent & smooth | Translucent & smooth | Translucent & smooth | Translucent & smooth | Translucent & smooth |
| 2.      | color                    | Greyish white        | Greyish white        | Greyish white        | Greyish white        | Greyish white        | Greyish white        | Greyish white        |
| 3.      | pH                       | 6.7                  | 6.7                  | 6.7                  | 6.7                  | 6.7                  | 6.6                  | 6.6                  |
| 4.      | Extrudability            | Excellent            | Excellent            | Excellent            | Excellent            | Excellent            | Excellent            | Excellent            |
| 5.      | Spreadability (g.cm/sec) | 20.24                | 20.24                | 20.24                | 20.24                | 20.24                | 20.23                | 20.23                |

**Fig 7:** Packaging and labelling of final formulation

## Conclusion

The formulation of flaxshine hair conditioning mask using active natural ingredients flaxseeds, rice water offers a promising avenue for sustainable haircare gels by joining the antioxidant, antidandruff, and strengthening properties of these ingredients, we can overcome problems like hair loss, dry hair, frizzy hair, dull hair and dandruff, and achieve healthy hairs. Furthermore, incorporating moisturizing agents ensure hydration and nourishment, enhancing overall hair health. Now a days natural remedies are used more likely in all over world because of their safety, affordability, easy availability and less side effects compared to chemical-based products. There are various hair haircare herbal cosmetics available in market but youth focus for strong, shiny hairs and frizz removal formulation, so overcome the problems regarding hairs like dull hairs, dandruff, frizzy hairs we formulate flaxshine hair conditioning mask with flax seeds, rice water and vitamin E enrich with qualities like hair strengthening, dandruff removal, moisturizing, nourishing

effect. Stability assures the shelf life of formulation and other evaluations parameters such as pH, viscosity, Extrudability, spreadability, skin irritancy, physical observations and various physicochemical tests used for evaluation purpose presents the significant outcomes, so based on it we can conclude that the flaxshine hair conditioning mask definitely satisfy hair related problems as elaborated above.

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