

# Formulation of Pomegranate Peel Herbal Shampoo

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**Abstract:** *The most vital aspect of the body is the hair. Hair is washed, beautified, and treated with the herbs. The study's primary objective is to prevent hair loss and promote hair growth because it is the most prevalent disorder. Shampoos are used to shine hair in addition to cleaning it. All forms of shampoo are available, including powder and liquid. Natural herbal shampoo with a focus on efficacy and safety while avoiding the risks of chemical chemicals It also encourages hair growth, strength, and darkening while removing sebum, dirt, and dandruff. The main component of this shampoo is pomegranate peels which is used to make hair follicles stronger and promotes hair growth. Natural components including Amla powder, aloe Vera gel, neem powder, hibiscus powder, and fenugreek powder combined with pomegranate peels powder were used to create natural shampoos. The herbal shampoo was assessed using physicochemical properties as PH, foam formation, surface tension, viscosity, and wetting test.*

**Keywords:** Shampoo base, pomegranate peels (Punica granatum), SLS (sodium lauryl Sulfate), Herbal shampoo, Evaluation parameters

## 1. Introduction

Absence of hairs, the person's skin is empty. Hair loss, unmanageable hair, a lack of hair volume, conditioning, immature greying, dandruff, thinning hair, dullness, etc. are problems connected with it. In the past, hairs were thought of as a protective covering for the scalp<sup>1</sup>. Using texture as a basis there are many types of shampoo like in powder form, in liquid form, in gel form and in solid form. Based on their function many shampoos are there: Baby shampoo, conditioning shampoo and Antidandruff shampoo<sup>2</sup>. This shampoo removes oil, grime, and dandruff while strengthening, darkening, and promoting hair growth. Additionally, it functions as a conditioning agent<sup>3</sup>.

Herbal shampoo was formulated by using ingredients such as pomegranate peel, Hibiscus powder, Amla powder, fenugreek powder, aloe Vera gel, Neem powder to make hair smooth and shiny. Benefits of herbal shampoo are that makes hair more shine, less hair loss, long lasting colour, stronger, not irritate scalp or skin<sup>4</sup>. Herbal treatment that includes fruit, seed, roots, wood, petals<sup>5</sup>. The ways in which herbal cosmetics are used on a daily basis have become quite diverse. There are many different kinds of these, such as herbal soaps, polyherbal soaps, herbal conditioner, face wash, shampoos, lip balms, and eye care products. The fact that all of the components in herbal cosmetics are natural is one of the most crucial and significant aspects of their manufacture<sup>6</sup>.

In addition to preventing dandruff and hair loss, the polyphenols in pomegranate peel powder also deepen hair colour<sup>7</sup>. Aloe vera's enzyme component prevents hair loss by shielding the scalp from any illnesses and gives smooth and shiny appearance<sup>8</sup>. Amla enhances hair development, nourishes the base of the hair completely, and stimulates the hair follicles<sup>9</sup>. Neem is used to dandruff as it contain antioxidants, anti-fungal, antibacterial functions<sup>10</sup>. Hibiscus Rosa used to prevent hair loss and encourage hair growth.

Fenugreek seed regenerates damaged hair and promotes hair growth<sup>11</sup>.

## 2. Materials and Method

Collection of ingredients: The part of plant like pomegranate for peel was collected from local market. The peel is dried in sunlight. Then converted into peel powder by using mixer.



**Figure 1:** Pomegranate Peel

Hibiscus powder, Amla powder, Neem powder, fenugreek powder, guar gum powder, guar gum powder and aloe Vera gel are collected from local market.

### Preparation of shampoo base

Take 5 gm of sodium lauryl sulphate (SLS) and add 12ml of distilled water, then prepare a solution of sodium chloride (NaCl) for this take a 2gm of NaCl and add 7-8ml water.

Mix both solution (NaCl solution in sodium lauryl sulphate solution).

### Preparation of pomegranate peel powder herbal shampoo

Hibiscus powder, Amla powder, Neem powder, Fenugreek powder, guar gum powder, pomegranate peel powder and aloe Vera gel are added in water for soaking it overnight. Then boiled that on medium flame and then cool the mixture

Volume 12 Issue 4, April 2023

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and filter it, then slowly to the solution of shampoo base that is made from SLS and NaCl (According to table 1). Add Rosemary oil as an essential oil for natural preservative and also for fragrance.

**Table 1:** Formulation table

Sr. No	Ingredient name	Quantity
1	Pomegranate peel powder	2gm
2	Amla powder	1.5gm
3	Hibiscus powder	1.5gm
4	Aloe Vera gel	2ml
5	Fenugreek powder	1.5gm
6	Neem powder	1.5gm
7	Guar gum	1gm
8	Essential oil	q.s
9	Shampoo base	20 ml

### Parameters of shampoo

#### Physical appearance

Physical properties of shampoo such as transparency, colour and odour were assessed<sup>12</sup>.

#### Foaming ability

The cylinder shaking method was used to assess the stability of the foam.

In a graduated cylinder with a capacity of 250 ml, 50 ml of shampoo formulation (1%) solution was added, and the cylinder was forcefully shaken for multiple times. By measuring the foam volume of a shake test after one minute and four minutes, respectively, foam stability was determined. After shaking the total amount of foam was measured<sup>12</sup>.

#### Dirt Dispersion test

In the dirt dispersion test, the amount of ink in the froth was measured, and the outcome was evaluated as none, moderate, medium, or heavy. In a wide-open test tube, two drops of formulated shampoo were introduced to 10ml of distilled water. A single drop of Indian ink was put to the test tube and then covered it, then it was shaken for 10 minute<sup>12</sup>.

#### Surface tension

The surface tension of the produced shampoo in distilled water (10% w/v) was measured using a stalagmometer at room temp<sup>12</sup>.

#### Consistency

The consistency of formulated shampoo was determined by hand. Take pinch of shampoo and rubbed it with finger<sup>12</sup>.

#### Wetting test

A disc with a diameter of one inch was carved out of 0.44g canvas paper. Place it on the shampoo solution's surface. Keep track of how long it will take for paper to soak in. Formulation and keeping track of time with a stop watch<sup>12</sup>.

#### PH determination

At room temp, the PH of the formulated shampoo in distilled water (10% v/v) was using a PH analyzer<sup>12</sup>.

#### Skin irritation test

An herbal shampoo preparation was applied to the skin, left on for five minutes, then rinsed off and assessed for skin sensitivity<sup>7</sup>.

#### Stability test

By storing the formulation at a temperature of 25 to 30°C, the stability of the formulation was investigated over time<sup>7</sup>.

#### Determination of solid content

In an evaporating dish, 4gm of shampoo solution was poured. Put the dish on hot plate evaporated the liquid part of the shampoo. There is still a lot of part in the dish. After drying, the weight of dish was calculated.

Formula for determination of solid content;

$$\% \text{ of solid content} = \frac{C-A}{B-A} \times 100$$

Where: A=weight of an empty evaporating dish, B=weight of an evaporating dish filled with shampoo solution, C=weight of an evaporating dish after the shampoo solution has evaporated<sup>13</sup>.

### 3. Results and Discussion

#### Physical appearance:

The prepared shampoo was found to be clear and brownish in colour.

#### Foaming ability:

Foaming ability is the important parameter in shampoo. The prepared herbal shampoo's foam volume was found to be 39ml. This volume had been consistent for a long time even after 4 minutes of viewing.

#### Dirt Dispersion:

Shampoo that concentrates the ink in the foam is regarded as being of low quality; the dirt stays in water. It will be tough to rinse off dirt that remains in the foam. Prepared shampoo has light dispersion.

#### Surface tension:

The surface tension readings can be used to determine the shampoo's detergency. The lower the surface tension, the more effective the shampoo will be at cleaning. The formulated herbal shampoo's surface tension was determined to be 32 dynes/cm.

#### Wetting test:

It is dependent on the concentration of surface. To calculate wetting time, the canvas disc approach is preferred. The formulated herbal shampoo shows the wetting time of about 120s. The maximum wetting time indicate that the shampoo contains lower amounts of detergents.

#### PH determination:

The pH of shampoo is important for balancing the scalp, enhancing hair quality, and preventing eye irritation, hair damage should be minimized. The pH of prepared shampoo was almost 6.5.

#### Determination of solid content:

It is quite tough to wash away if the solid concentration is too high. The solid content of designed shampoo was 12%.

#### Stability test:

During the storage term, formulation stability showed that they were both chemically and physically stable. The

designed herbal shampoo is physically and chemically stable at 25–30 °C, which is considered to be ordinary room temperature.

- **Skin irritation test:**

According to the tests for skin irritation, the herbal shampoo has no negative effects on the skin. It contains less amount of chemicals that produces harmful effect on skin. In this L all ingredients are naturally occurring.

**Table 2:** Parameter Result

Sr. No	Parameters	Observation
1	Colour	Brownish
2	Odour	Characteristic
3	Consistency	Smooth
4	Foaming index	39
5	Wetting test	120
6	Surface tension	32
7	PH	6.5
8	Percentage of solid content	12%
9	Skin irritation	No irritation
10	Stability test	Stable

#### 4. Conclusion

The usage of herbal products by consumers has significantly grown over the past several years, according to a study of worldwide hair care industry trends. The current study has made the greatest efforts to create a herbal shampoo that will not only protect hair but also provide conditioning, anti-dandruff, cleaning, shine, and manageability. Herbal shampoo was created with the use of ancient herbs that are both safe and effective. Synthetic conditioning chemicals are used to lessen protein or hair loss. Aloe Vera gel replaces as natural conditioning agent.

Hence we conclude that the formulation of pomegranate herbal shampoo is effective in reducing dandruff, less side effects, less irritation, enables hair growth and better effect of conditioner. The aesthetics inspection of Ph, dirt dispersion, surface tension, foam ability, wetting test were analyzed. Because of its less negative effects and affordable price, herbal cosmetics are currently in demand. As the result, the pomegranate based herbal shampoo is safe and effective to use.

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