

# FORMULATION AND EVALUATION OF HERBAL SHAMPOO

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**Abstract-** In the present study, herbal shampoo was formulated containing suitable ingredient such as Fenugreek seeds, Keezhanelli, Hibiscus and *Aloe vera* in different proportions to formulate and evaluate its physicochemical properties. In the haircare products the shampoo is mostly used and the largest unit sale one. Which is a daily used cosmetic product. Artificial compounds like Synthetic preservatives and detergents have sometimes been the cause of adverse effects among consumers. A more radical approach in reducing the synthetic ingredients is by incorporating natural extract whose functionality is comparable with their synthetic ingredients. A shampoo is a cleaning aid for the hair and is counted among the foremost beauty products. Today's shampoo formulations are beyond the stage of pure cleaning of the hair. This herbal shampoo was formulated using natural ingredient like Fenugreek seeds), *Aloe vera* (aloe), *Hibiscus rosasinensis* (china rose) with proven efficacy of hair care preparation is prepared. The combination of several such ingredient of herbal origin has made it possible to secure highly effective dry powder shampoo.

**Keywords:** Herbal shampoo, ), *Aloe vera* (aloe), *Hibiscus rosasinensis* (china rose) and Synthetic preservatives.

## INTRODUCTION

Shampoo is a FMCG (fast moving consumer goods) hair care product used for removal of oils, dirt, skin particles, dandruff that gradually build up in the hair. The goal is to remove unwanted build up without stripping out so much sebum as to make hair unmanageable. The shampoo along with its ingredients help in the cleaning and moisturizing of hair follicles, derma, and the hair cells. This shampoo becomes an essential component in our day-to-day life in the cleaning and maintenance of hair and hence needs to be harmless and the chemical compound within the universal standard limits.

The main challenge that is faced in the shampoo is their chemical ingredients used in manufacturing. The characteristic features of a shampoo are determined by the ingredients within them. Several chemical compounds used like parabens, formaldehyde, sulphates, triclosan, resorcinol, hexachlorophene, dimethicone can cause side effects on the scalp as well as in the keratin present in the hair. Former chemical shampoo has these all compounds as ingredients which are highly probable in causing diseases like cancer, dandruff, itching, allergy in human derma.

Shampoo is generally made by combining a surfactant most often SLS, preservative, cleansing agent, fragrance. These products are added to maximize the following qualities:

- 1.Foaming capacity
- 2.Fragrance
- 3.Rinsing capability
- 4.Biodegradability
- 5.Less irritation

Foaming capacity is the main feature of a shampoo which enhances the cleansing action and dirt dispersion in scalp. Fragrance is used so that the shampoo smells good along with our scalp and hair. Rinsing capability is a feature that enhances the rinsing action of hair in the dirt removal. Biodegradability of a shampoo is essential in the preventing of environmental pollution. The chemicals used in the shampoo can affect the soil, water resources while the shampoo is discharged into the environment. This can reduce the soil fertility and percolation rate of the soil. Also, there will be a decrease in the quality of water that can make it unfit for consumption.

The biggest challenge we undergo today is the contribution of chemicals in shampoos which are used to improve the quality of shampoo's effect on hair.

But the huge drawback in using the chemical shampoos is their side effects such as follows:

- 1.Increased hair fall
- 2.Change in hair texture
- 3.Increased frizz
- 4.Decreased hair density
- 5.Decreased hair strength

In order to prevent the problems, natural shampoos are being produced which contain natural care products in it.

The natural shampoos are prepared by using herbs and natural compounds which are good and harmless to the hair. Natural herbs have harmless compounds such as finasteride and minoxidil that improve hair and alopecia. Many such compounds are present in flowers, plant leaves, plant seeds and even in roots. The extract from these parts can be used in shampoo so the benefits are available for the hair in shampoo.

Among the herbs fenugreek seeds are rich in protein and nicotinic acid content renowned for their capacity to fight hair fall and dandruff. It can boost blood circulation and helps reduce dandruff. The flower coat buttons are well known for their prevention in hair fall and in treating premature growing of hair. Also they convert grey hair into black permanently. The keezhanelli root promote hair growth and support the strands of hair from breaking. Hibiscus and aloe vera extracts are used for conditioning the hair and prevent from dryness. Aloe vera can help itchy scalp and gives strength. Hibiscus stop hair loss, thicken hair and also treat dandruff. These adverse range of benefits of herbal extract is being used in shampoo and developing it further.

This project is about the production of three different natural shampoos and their comparative studies regarding the advantages and effects on hair. Also, clinical tests are done for the verification of shampoo stability and its effects on the hair and scalp. Here the main components in shampoos have been changed for the analysis of the best among them.

### Methodology

Grind the plant material along with equal volume of water using mortar and pestle. Then transfer the grinded paste to beaker. After that, filter the paste using filter paper.

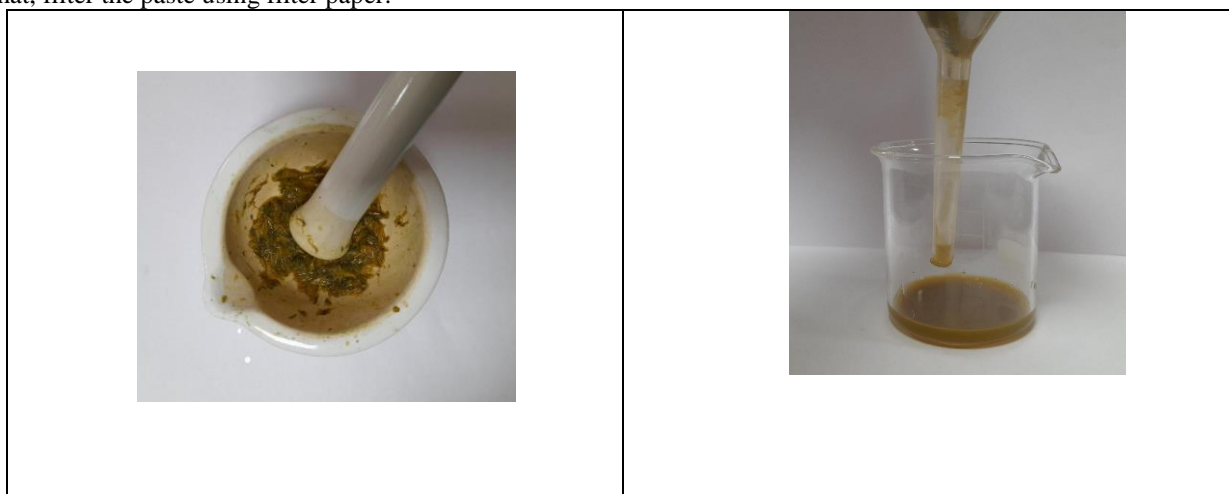


Figure 1 Coat button extract



Figure 2 Fenugreek extract

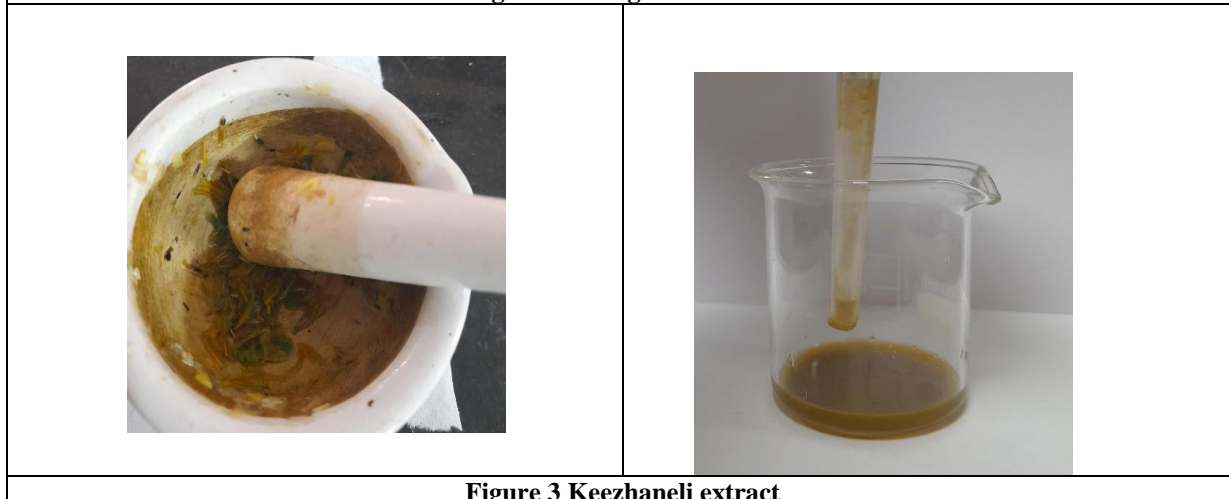


Figure 3 Keezhanelli extract

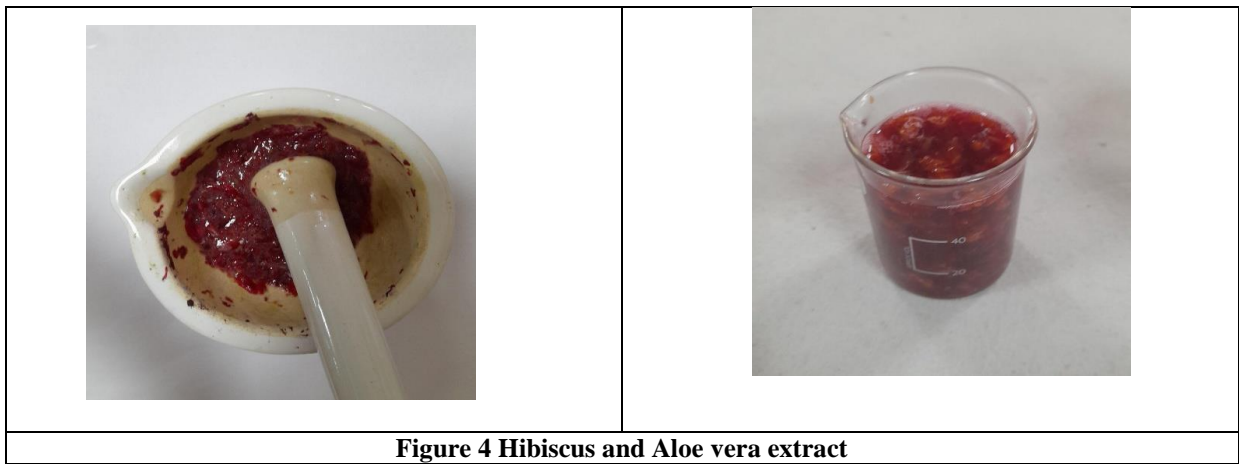


Figure 4 Hibiscus and Aloe vera extract

### PREPARATION OF SHAMPOO

Preparation of three shampoos namely fenugreek shampoo, coat buttons shampoo, keezhaneli root shampoo. Preparation of 15 ml shampoo.

1. Take 3ml of water in 3 beakers.
2. Add 1g of SLS in each beaker.
3. Add 0.5ml of preservative in each beaker and mix well.
4. Along with that, add 0.5ml of glycerine in each beaker.
5. With the above mixture, add 8 ml of hibiscus and aloe vera extract in each beaker separately.
6. Then add 2ml of fenugreek extract to the first beaker, add 2ml of coat button extract to the second beaker, add 2ml of keezhaneli root extract to the third beaker.
7. Mix all the ingredients well.
8. Add 1ml of Gelatine to each beaker.
9. Mix well until all ingredients get mixed.

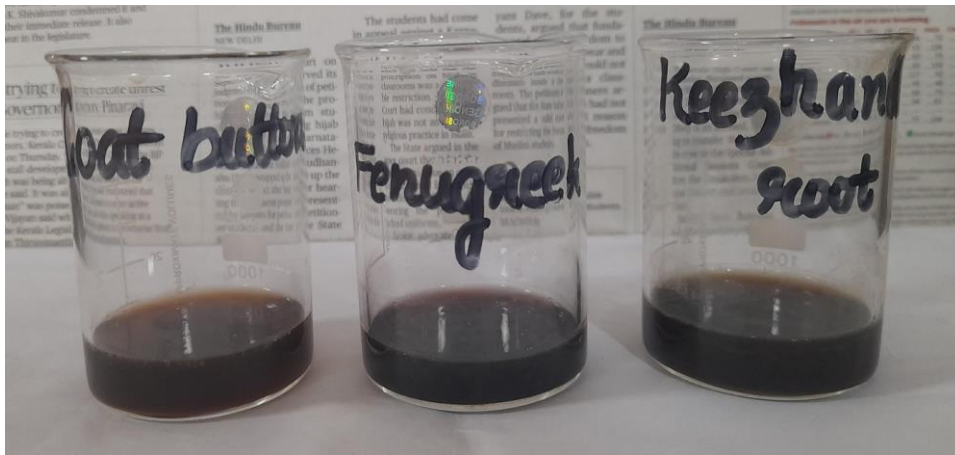


Figure 5 Prepared sample of shampoo

### QUALITY TEST FOR SHAMPOO

#### pH TEST:

- pH test measures how the solution is acidic, basic or neutral.
- If you are using a shampoo that is too high or low on the pH scale, then you might be interfering with your scalp's natural pH balance, causing hair damage and scalp irritations. So, pH is important.
- Steps of pH test:
  - Prepare the shampoo according to the procedure above.
  - Turn the pH meter on, calibrate it if needed and dip it into the shampoo solution.
  - With the meter, the results will appear after a second or two, either on a dial or a digital interface if you decide to go for the pricier option

#### FOAM TEST:

- The foam test measures the foaming tendency of a shampoo
- A rich lather with a pleasant creaminess helps a shampoo feel more luxurious and as such, how a shampoo foam is critical to success.
- Steps of foam test:
  - Take 5ml of shampoo in measuring cylinder and make the volume for 25 ml by using water.

- Then shake properly for ten times and make a stock solution.
- Take 5 test tubes. Add stock solution of 1ml, 2ml, 3ml, 4ml, 5ml to each test tubes respectively.
- Then make up the volume of test tube to 10ml.
- Shake the test tubes for ten times for formation of foam.
- Then measure the foam in each test tube in terms of centimetre and calculate the foam index

S.NO.	Number of test tubes (ml of stock solution)	Height of the foam (cm)
1	1ml	0.9
2	2ml	1
3	3ml	3
4	4ml	4
5	5ml	5

Table 1 Foaming index observation table

**Foaming index-1000/A**

A- Volume of decoction having exact 1 cm height

**WETTING TEST:**

- The wetting ability of a surfactant depends on its concentration in the formulation and the test is commonly performed to test the efficacy of the surfactant.
- The wetting time test is performed by measuring the time taken for the disc to sink in the shampoo solution.
- Steps of wetting test:
- The canvas is cut into 1 inch diameter disc having average weight of 0.44g
- The disc is floated on the surface of shampoo solution of 1% w/v and the stopwatch is to start
- The time required for the disc to begin to sink in the shampoo solution was measured accurately and wetting time should be noted.

**Result and Discussion****Wetting time**

The resulting wetting time was 3.5.

This concludes that the herbal shampoo has high efficacy of the surfactant, hence has more cleansing action.

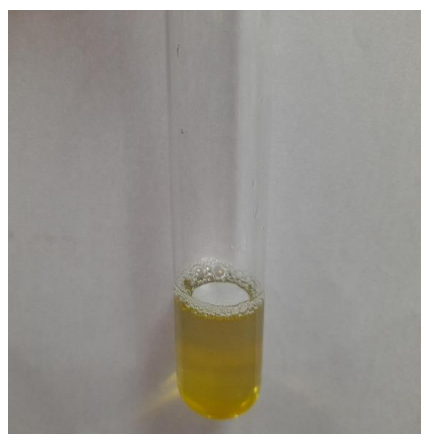
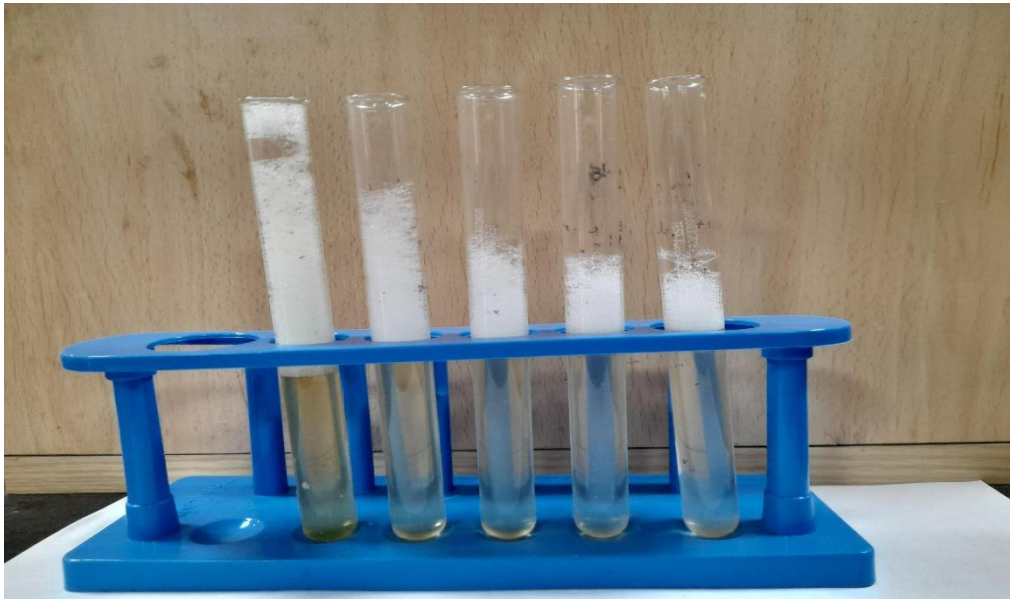


Figure 6 Canvas disc in shampoo solution

**pH**

The resulting pH was 7.5, which concludes that the shampoo is less harsh on scalp. The shampoo can be used beyond a range of people and there will be no itchiness in the scalp or dryness of hair.

**Figure 7 pH meter in shampoo solution**

**Foaming index**

The foaming index is determined as 500. This means that the shampoo is more soft and have good foaming tendency.



**Figure 8 Foaming in shampoo solution**

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**Declaration of Interest:** The authors report no conflicts of interest. Source of funding is nil.

**Ethical Clearance:** Nil

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