

Formulation and Evaluation of Herbal Shampoo

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Abstract: Herbal shampoos have gained significant attention due to their mildness, biodegradability, and therapeutic benefits. This study focuses on the formulation and evaluation of an herbal shampoo using natural ingredients such as Shik Akai (*Acacia concinna*), Reetha (*Sapindas mukorossi*), Amla (*Emblica officinalis*), Aloe vera (*Aloe barbadensis*), Neem (*Azadirachta indica*), and Hibiscus (*Hibiscus rosa-sinensis*). These ingredients were selected for their cleansing, conditioning, antimicrobial, and hair-strengthening properties. The formulated shampoo was evaluated for pH, viscosity, foam stability, detergency, surface tension, wetting time, and antimicrobial activity. The results indicated that the herbal shampoo exhibited satisfactory cleansing, good foaming capacity, balanced pH (suitable for scalp health), and significant antimicrobial properties compared to commercial synthetic shampoos.

Keywords: Herbal shampoo, natural surfactants, plant extracts, hair care, eco-friendly, antimicrobial.

INTRODUCTION

Hairs are integral part of human beauty. People Are using herbs for cleaning, beautifying and Managing hair since the ancient times. These Reasons attracted community towards the herbal Products, which are less expensive and have Negligible side effects. It does not only have hair cleansing purpose but also imparts gloss to hair and used to maintain their manageability and Oiliness free.

Herbal shampoos are the cosmetic preparations that with the use of traditional ayurvedic herbs are meant for cleansing the hair and scalp just like the regular shampoo.

They are used for removal of oils, dandruff, dirt, environmental pollution.

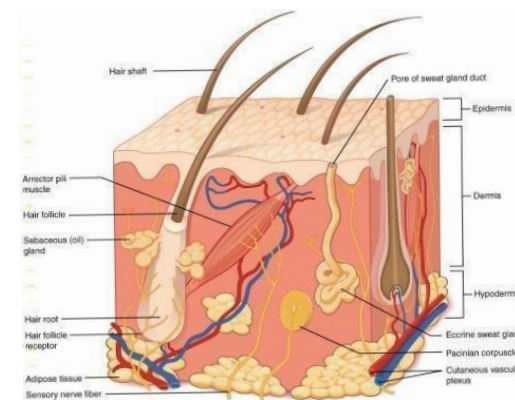


Fig.No.1 (Structure of Hair)

SHAMPOO

Shampoos are essential hair care products designed for cleansing the scalp and hair by removing dirt, sebum, and environmental pollutants. While synthetic shampoos are widely available, they often contain harsh chemicals such as sulphates, parabens, and synthetic fragrances, which can cause scalp irritation, dryness, and hair damage with prolonged use.

HERBAL SHAMPOO

Herbal shampoos are formulated using plant-based ingredients that provide both cleansing and therapeutic benefits. Natural surfactants like Reetha (*Sapindas mukorossi*) and Shik Akai (*Acacia concinna*) offer gentle cleansing without stripping natural oils, while Amla (*Emblica officinalis*), Aloe vera (*Aloe barbadensis*), Neem (*Azadirachta indica*), and Hibiscus (*Hibiscus rosa-sinensis*) contribute to hair nourishment, scalp health, and antimicrobial protection.

IDEAL PROPERTIES OF HERBAL SHAMPOO

1.Cleansing Efficiency: The shampoo should effectively remove dirt, oil, and impurities from the hair and scalp without causing dryness damage. Herbal surfactants like Reetha (*Sapindas mukorossi*)

and Shik Akai (*Acacia concinna*) should provide mild but efficient cleansing.

2. Gentleness: It should be gentle on both the scalp and hair, maintaining the natural oils to prevent irritation, dryness, or stripping of the scalp's protective layer.

3. PH Balance: An ideal herbal shampoo should have a pH level close to that of the scalp (approximately 4.5 to 5.5). This helps to maintain scalp health, avoid irritation, and prevent dandruff or excess oil production.

4. Conditioning Properties: In addition to cleansing, the shampoo should have conditioning benefits, promoting smooth, shiny hairs.

5. Foam Formation: The shampoo should produce a stable, abundant foam that helps in the even distribution of the product and enhances the user experience. Herbal shampoos may have a different foaming capacity compared to synthetic ones, but a moderate level of foam is ideal.

6. Antimicrobial and Antioxidant Effects: Ingredients such as Neem (*Azadirachta indica*) and Hibiscus (*Hibiscus rosasinensis*) provide natural antimicrobial properties that help combat scalp infections, dandruff, and other conditions while protecting the hair from oxidative damage.

1) AIM AND OBJECTIVE AIM:

Formulation and evaluation of herbal shampoo.

OBJECTIVE:

Herbal shampoos are made from pure and organic ingredients and there are no synthetic additives or surfactants are free of any side effects. Are biodegradable and earth friendly

- It doesn't cause irritation to the eyes.
- It is cost friendly, not much expensive.
- Regular usage of herbal shampoo can do wonders for your hair.
- By using herbal shampoo, you can get the perfect oil balance.
- They are made from natural essential antiseptic properties that prevent our hair and scalp from the harsh U.V rays of the sun thus preventing skin infections.

2) DRUG PROFILE:

AMLA:

- Family: Euphorbiaceae.
- Binomial name: *Phyllanthus embolic*
- Botanical name: *Embllica officinalis* Garten.

- Colour: Green changing to light yellow



Fig.No.2(Amla)

- Odour: None
- Taste: Sore and Astringent
- Shape: The fruit are depressed Size: 1.5 to 2.5 in diameter
- Extra features: Fruit are fleshy four alkaloids are very hard and smooth in appearance. • Chemical constituents: Tannis, Alkaloids.

3) EXCIPIENT PROFILE:

a. ALOE VERA:



Fig.No.3(Aloe Vera)

It is commonly known as Ghrita Kumari, Korp hand Musab bar. It is dried juice of leaves of Aloe Barbadensis miller belonging to family Liliaceae. The juice contains Aloe-emodin, barbaloin, Isobarbaloin, B-barbaloin, resins, Aloetic acid, homonotaloin, aloes one chrysophanic acid, chrysamminic acid, galacturonic acid, saponins. The juice is used as Purgative, Anti- inflammatory, Treatment of burns a itching and uses in skin cosmetics as a protective due to its anti-wrinkle.

b. NEEM:



FigNo.4(Neem)

It is commonly known as Margosa. It Consist of all aerial part of plant known as *Azadirachta indica* belonging to family *Meliaceous*.

The plant contains Diterpenes (sugiol, nimboil) Triterpenes: - Bsitosterol, stigma sterol Limonoids: - Meliantriol, Nimbidinine, Nickelodeon, azadirachtin the plant is used as Antimicrobial, Insect Repellent, Insecticide, and Antibacterial.

Neem has been widely used in Ayurveda, Unani, and traditional medicine systems for various health benefits.

Neem has hepatoprotective properties, which may help in liver detoxification and support liver function. Studies suggest it may be beneficial in conditions like liver fibrosis and cirrhosis.

c. REETHA:

It is commonly known as Washnut, soapnut, soapberry. It is dried fruit of plant *Sapindas mokorossi* belonging to family *Sapindaceous*.

The fruit contains mainly saponins, (10%- 11.5%) sugar (10%) & mucilage, Triterpenes, Six sapindoside (sapindoside A, B, C, D) & mukorossi saponins (E1 & Y1). The fruit is used for shining hair, curing hair issue, Natural cleanser, Detergent foaming property.



Fig.No.5(Reetha)

Reetha (*Sapindas mukorossi*), also known as soapnut, is a natural cleanser with multiple uses in health, beauty, and household applications.

d. SHIKAKAI:



Fig.No.6(Shikakai)

It is commonly known as Shik Akai, soappod. It is dried seed of plant *Acacia rugate* belonging to family *Leguminosae*. The seed extract contains Lupeol, spinasterol, acacia acid, lactone & the natural sugar glucose, arabinose & rhamnase.

It also contains hexaconazole, spinasterrone, oxalic acid, tartaric acid, citric acid, succinic acid, ascorbic acid, nicotine. It is used an Ayurveda medicinal plant, traditionally used in shampoo and used in a detergent.

Natural Cleanser: Shik Akai acts as a gentle cleanser, removing dirt and excess oil from the scalp.

e. ORANGE PEEL:

Is commonly known as orange peel. It consists of a fruit of *Citrus sinensis* belonging to Family *Rutaceae*.



Fig.No.7(Orange Peel)

It contains Terpenes such as Carveol, Carvone Menthol, Perilya Alcohol and Perillaldehyde. Orange peel is used for making Perfume and soap.

Orange peel is rich in nutrients and bioactive compounds, making it useful for various health, culinary, and skincare purposes.

Dried orange peel can be brewed into a tea for digestion and relaxation.

MATERIAL AND METHOD

1. PREPARATION EXTRACT:

- To prepare the extract, 50g of fresh Amla powder leaves were cooked in 75ml of water and then filtered.
- After boiling 50g of powdered *Acacia concinna* (Shikakai) dried fruit in 75ml of water, the mixture was strained.
- Twenty-five millilitres of *Aloe barbadense* (aloe) juice were extracted from the leaves.
- Twenty-five grams of fresh *Azadirachta indica* (neem) leaves were cooked in twenty-five millilitres of water and then filtered.
- After boiling 50 grams of powdered *Spindus mokorossi* (Reetha) fruits in 75 millilitres of water, the mixture was filtered.

2. PREPARATION OF HERBAL SHAPOO:

1. First, a base was made with 40 millilitres of water and 5 grams of sodium carboxymethyl cellulose.
2. 50 ml of Reetha extract and 50 ml of Shikakai extract were combined in a 250 ml beaker and thoroughly swirled.
3. Next, 50 millilitres of extract from amla powder were added.
4. 10 ml of Neem extract and 25ml of Aloe vera extract was added.
5. 5ml of propyl paraben was added as a preservative.
6. Above extract was stirred for 15 min.
7. 10 ml of orange peel extract was added as a perfuming agent and stirred for 5 min.
8. The shampoo was prepared and placed into a 250ml plastic container.

Table.No.1(Name of Ingredients)

Sr. No	Name of Ingredients	Quantity
1)	Amla Powder Extract	60ml
2)	Shikakai	60 ml
3)	Reetha Extract	60 ml
4)	Neem Extract	10 ml
5)	Aloe Vera Juice	10 ml
6)	Propyl Paraben	5 ml
7)	Sodium Carboxy Methyl Cellulose	50 ml

Table.No.2 (Role of Ingredients)

Sr. No	Name of Ingredients	Role
1)	Amla Powder	Darken hair
2)	Aloe Vera	Conditioning Agent
3)	Neem	Antibacterial
4)	Reetha	Foaming Agent
5)	Shikakai	Foaming Agent
6)	Orange Peel	Performing Agent
7)	Propyl Paraben	Preservative
8)	Sodium Carboxy Methyl Cellulose	Thickening Agent
9)	Water	Vehicle

RESULT**PHYSICAL APPEARANCE:**

Both formulations prepared were evaluated in terms of their colour, odour, and appearance

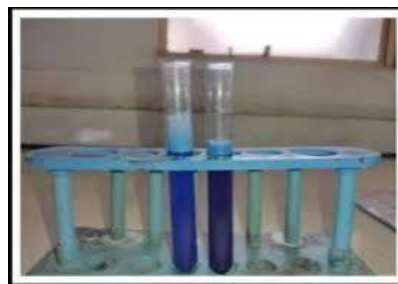
• DIRT DISPERSION:

Fig.No.8(Dirt Dispersion)

Ten millilitres of distilled water were placed in a big test tube, and two drops of shampoo were added. After adding 1 millilitre of India ink, the test was stopped and shaken ten times. It was judged that there was none, light, moderate, or heavy ink in the foam.

• FOMING ABILITY FOAM STABILITY:

Using the cylinder shaking method, the foaming ability was assessed. To put it briefly, a graduated cylinder was filled with 10 millilitres of the herbal shampoo solution.



Fig. No. 9(Foam Test)

It was shaken ten times and covered with one hand. Following a minute of shaking, the total volume of foam content was noted. The foam volume was recorded during a 1- and 4-minute shake test to assess foam stability.

• Procedure for determination of viscosity:

1. Use warm chromic acid to thoroughly clean the Ostwald viscometer, and acetone or another organic solvent if required.

2. Position the viscometer vertically on an appropriate stand. iii. Fill the dry viscometer with water until mark G is reached.
3. Calculate how long it takes for the water to go from mark A to mark B in seconds.
4. To get an accurate reading, repeat step 3 at least three times.
5. Rinse the viscometer with the test liquid, then fill it to mark A, Measure how long it takes for the liquid to flow to mark
6. Calculating the liquid densities as specified in the density determination experiment.



Fig.No.10 (Determination of Viscosity)

- Procedure for determination of density:
 - I. Use nitric acid or chromic acid to thoroughly clean the specific gravity bottle. Use distilled water to rinse the bottle at least two or three times.
 - II. If necessary, rinse the bottle with acetone or another organic solvent and pat dry. iv. Using the capillary tube stopper (w1), weigh the empty, dry bottle.
 - III. Pour the unknown liquid into the bottle, cover it with the stopper, and use tissue paper to remove any extra liquid from the tube's outside.
 - IV. Use an analytical balance to weigh a bottle containing an unknown liquid (w2).
 - V. Determine the weight of the unknown liquid in grams ($w_3 = (w_2 - w_1)$).



Fig. No. 11(Determination of density)

- Determination of solid content percentage:



Fig.No.12(Determination of solid content)

DISCUSSION

The preparations known as herbal shampoos are used to cleanse and wash hair while also nourishing it. Because they contain only natural or herbal elements rather than artificial chemicals, herbal shampoos are commonly utilized because they have less or no negative effects than conventional shampoos. Herbal shampoo is safe for the environment and your skin, and it doesn't involve animal testing.

CONCLUSION

A variety of herbal substances were used in the formulation of the herbal liquid shampoo. Based on their evaluation factors, we can infer from the overall results that the herbal shampoo formulation was safer, more stable, and more effective.

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