



# HERBAL SHAMPOO

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## ABSTRACT

A focus on safety, effectiveness, and the elimination of harmful chemicals and their substitution with safe, natural alternatives, the goal is to formulate and assess herbal shampoo as well as assess its physicochemical function. Different amounts of Pomegranate, Aloe vera, Curry leaves, Ginger, Orange Oil, Reetha, and Tragacanth Gum extracts are used to make shampoo. The organoleptic, physicochemical, and performance tests that were assessed included the wetting time test, pH, solid contents, surface tension, dirt dispersion, foam stability, and viscosity. The cleanser that was created was clear and appealing. It demonstrated little surface strain, good cleaning, detergency, foam stability, and efficient conditioning.

The shampoo formulation's physicochemical examination yielded the best results. To improve its quality, product performance, and safety, extra effort was necessary.

**Keywords:** Herbal shampoo, Pomegranate, Aloe vera, Curry leaves, Reetha

## INTRODUCTION

### COSMETICS

The Greek word "Kosmetikos," which means "having strength" and "garnishing the skin," is where the word "cosmetic" originates. Cosmetics are various products like cream, lotions, perfumes, skin, hair cleansing products, and beautifying cosmetic sector. Natural substances are extensively used in cosmetic preparations. Cosmetic products containing naturally obtained ingredients and chemical free cosmetic products have become a craze at present. Consumer attraction for the herbal cosmetics in the future is predicted to grow significantly. According to the Drugs and Cosmetics Act, cosmetics are defined as articles intended to be rubbed, poured, sprinkled or sprayed on, introduced into or applied to any part of the human body for cleansing, beautifying, promoting attractiveness or altering the appearance

### Herbal Cosmetics

Herbal cosmetics, which are referred to as products from now on, are made with a variety of acceptable cosmetic ingredients to create a basis, and then one or more herbal ingredients are added to provide specific cosmetic benefits. A wide range of herbal cosmetics are manufactured and frequently used for everyday reasons. The general public highly praises herbal cosmetics such as face wash, shampoo, conditioner, soaps, and even many more. The nicest part about herbal cosmetics is that only herbs and shrubs are used to make them. The natural

ingredients in the herbs don't react with the body; instead, they help it with vitamins and other beneficial minerals. Herbs These agents are becoming more and more well-liked because, in today's world, the majority of women choose natural products over chemicals for personal care to improve their appearance. This is because natural products give the body nutrients, improve health, and provide satisfaction because they don't contain synthetic chemicals and have fewer negative effects than synthetic cosmetics.

## SHAMOPOO

## HERBAL

One type of cosmetic product that is used to get rid of dirt from hair is herbal shampoo. Shampoos are detergents with an adhesive solution that contain active chemicals, appropriate additives, and

soap, after which shampoo products were produced. Shampoo is a product of a surfactant in a suitable liquid, solid, or powder form that is used under certain conditions to remove skin debris, surface oil, and grime from the hair shaft without giving any negative side effects to the users. The most important component of human beauty is hair. Typically, shampoos are made up of a variety of components. These are divided into three categories: cleaning agents, conditioners that add softness and gloss to minimise flyaway and improve disentangling, additives that help the product stay stable and comfortable, and special care ingredients that are meant to address particular issues like greasy hair and dandruff. Since ancient times, many individuals have used herbs to clean, adorn, and manage their hair. Over time, synthetic agents have dominated the market, but consumers are now aware of how damaging they are to hair. These factors drew the population to herbal products because they are less costly and have less negative effects. In addition to their cleansing properties, herbal shampoos are used to preserve the manageability and oiliness of hair as well as to add gloss.

### Ideal properties of herbal shampoo

- Shampoo should effectively remove the dust, dirt and extreme sebum from scalp and hair.
- Shampoo should effectively wash hair and it should be easily removed by rinsing with water.
- Shampoo should withdraw from hair non-dry, lustrous, and better manageability.
- Shampoo should not make hand rough.
- Shampoo should not have any adverse effect and should be free from the skin irritation and eye.
- Shampoo should spread and disperse easily overhead and hairs and it must develop dense and luxurious lather

### ADVANTAGES

- ✓ Pure and organic ingredients are used.
- ✓ These shampoos are free from side effects.
- ✓ No synthetic additives such as sodium lauryl sulphate.
- ✓ No animal testing and Skin friendly.
- ✓ These shampoos help in the strengthening the root which in turn helps in increasing the growth of hair.
- ✓ Herbal shampoos also help in increasing the shine of hair therefore for one who suffers from dry and dull hair these herbal shampoos are beneficial.
- ✓ It enhances the roots and helps in the formation of new root which are soft then before.
- ✓ Herbal shampoos help in reducing the dandruff production in the scalp.
- ✓ They may be beneficial in reduction of hair fall

## DISADVANTAGES

- ✓ Some herbs are sensitive to scalp. Example: lemon, menthol
- ✓ Natural products affect product uniformity and quality control.
- ✓ Seasonal variation of plant constituents occurs
- ✓ Less stable so, preservative should be added.
- ✓ Varying in consistency from batch to batch
- ✓ Dry shampoo doesn't clean hair and Skin allergies may occur.

## PLANT PROFILE

### Drug profile:

#### 1. Pomegranate

##### Synonym

Lilac, Mauve, Amethyst.

##### Biological source

The pomegranate belongs to the family Lythraceae (previously Puniceae) with only two different species namely *Punica granatum* and *Punica protopunica*. These are planted either for its edible fruit or as an ornamental tree.

Genus: *Punica*

Species: *P. Granatum*

##### Geographical source

The pomegranate is native to a region from modern-day Iran to northern India. Pomegranates have been cultivated throughout the Middle East, South Asia, and Mediterranean region for several millennia, and it is also cultivated in the Central Valley of California and in Arizona.

##### Morphological characteristics

The pomegranate is considered a shrub, which has abundant foliage, a height around 5m, which generally adapts to Mediterranean climates. The leaves are green, elongated. The flower is flared and consists of 5 to 8 bright orange petals.

##### Chemical constituents

Pomegranates peel contain high levels of a diverse range of phytochemicals including polyphenols, sugars, fatty acids (conjugated and non-conjugated), aromatic compounds, amino acids, tocopherols, sterols, terpenoids, alkaloids, etc. *P. granatum* contains chemical and flavones constituents like ellagic acid, ellagitannins, Punic acid, anthocyanins, estrogenic flavonoids.

Uses:

Keratin fibres and follicles are nourished, cleansed, and hydrated by pomegranate peel and peel extracts. Ellagitannins from pomegranate peels have potential as stabilisers and food preservatives. Pomegranate peel can be used commercially to produce antioxidants. *Punica granatum* peel extract in aqueous form exhibits

wound-healing properties. Additionally, the fruit juice inhibits low density lipoprotein. *P. granatum* contains phytoconstituents that have antiviral, antibacterial, anti-inflammatory, anticarcinogenic, antiparasitic, and antidiabetic properties.

## 2. Aloe vera

### Synonym

- ❖ *Aloe barbadensis* Mill
- ❖ *Aloe barbadensis* var
- ❖ *Aloe chinensis*
- ❖ *Aloe elongata* Murray

### Biological source

The biological source of aloe is dried latex of leaves of it. It is also known as *curacao aloe*, *cape aloe* and *socotrine aloe*. It belongs to the Liliaceae family.

### Geographical source

Aloes is the indigenous to eastern and southern Africa and grown in Cape colony, Zanzibar and islands of Socotra. Aloe species are mostly inhabitants of arid climates, and are widely distributed in Africa, India, and other arid areas. The largest number of Aloe species is approximately 140, and most are found in South Africa. However, they could also be grown in subtropical summer rainfall and winter rainfall regions.

### Botanical source

The botanical name of Aloe vera is *Aloe barbadensis miller*. It belongs to Liliaceae family, and is a shrubby, perennial, xerophytic, succulent, pea- green color plant. It grows mainly in the dry regions of Africa, Asia, Europe and America. Formulation And Evaluation Of Herbal Shampoo

### Morphological characteristics

It is a succulent and evergreen perennial plant. It is a stem less or short stemmed plant, grows up to 60-100 cm of height, leaves are thick and fleshy. They may be green to grey- green in color. Margin of leaves are serrated and it has small white teeth. The shape of leaves is rosette shape. Large amount of pulp is present in the parenchyma of leaves. The size of flowers are 90 cm. Flowers have a yellow tubular corolla which is up to 2-3 cm. The color of flower is ranging from white to yellow to orange to near-red. Seeds are held in dry capsules. It has no calyx. Roots grow wide and not too deep in soil. Roots forms an arbuscular mycorrhiza. Fruits of aloe are triangular capsules. Seeds are winged.

### Chemical constituents

The chief chemical constituent of aloe is aloe-emodin, it is present as a glycoside in the various species of aloe. They also composed of anthrones and anthranols, which may be present in free or combined form as glycoside. It also contains is barbaloin and resins. The active resin present in aloes is also known as

aloesin. Other chemical constituents are volatile oil, it also contains amino acids, enzymes, vitamins and minerals. Sugars and hormones and salicylic acid, steroids are also present in aloe.

**Uses;** It has purgative property and used to treat painful inflammatory manifestations. Aloe gel is used to treat and cure radiation burns to get immediate relief from itching and pains. It is usually applied with carminatives. It is an ingredient of lotions, yogurt and beverages and some desserts. Used to treat skin wounds. It helps to reduce psoriasis and rosacea, warts. helps to reduce ageing and wrinkles. It also reduces eczema. It also has body cell regeneration ability. It generates movement of bowel in the condition of constipation. Helps to heal insect bites, rashes, sores and fungal infection. It is used to treat herpes and urticaria and conjunctivitis. It is used to treat vaginal infection and allergic reactions. Its boiled

### 3. Reetha

#### synonym

Indian soapberry, washnut, Ritha

#### Biological source

it is obtained from the dried fruit of *sapindus trifoliatus*, *sapindus mukorossi*. *sapindus mukorossi* is a species of tree in the Sapindaceae family.

Genus: *Sapindus*

Species: *S. Mukorossi*

Family: Sapindaceae

#### Geographical source

It is a deciduous tree that grows in the lower foothills and midhills of the Himalayas at altitudes of up to 1,200 meters (4,000 ft).

#### Morphological characteristics

An attractive medium sized deciduous tree, Reetha (*Sapindus mukorossi*) stands up to 20 m in height, with gray smooth bark and pinnate leaves. The tree bears leaves in 5-10 pairs, with large drupes.

**Chemical constituents:** The major constituents present in Reetha are saponins, sugars and mucilage. The seed kernels of Reetha are a rich source of proteins and show a balanced amino acid composition as per the World Health Organization. In addition to proteins, sugars and fibers are also present.

#### Uses

Reetha is widely used in preparations like shampoo. The dried fruit powder may be used as a foaming agent in shampoos. Provide nourishment to the hair scalp and promote hair regrowth. Reetha plant is beneficial in balancing Kapha doshas, lowers cholesterol levels and treats respiratory problems. The roots and bark are expectorant and demulcent in nature and the fruit with a bitter and astringent quality works as an expectorant and anthelmintic.

#### 4. Curry leaves

##### synonym

*Murraya koenigii*, *Bergera koenigii*, Kalashakh

##### Biological source

It is obtained from the dried leaves of *Murraya koenigii* (L.) The curry leaf tree is known to belong to the genus *Murraya* and family Rutaceae.

##### Geographical source

*Murraya koenigii* originates from east and south part of India, Pakistan, Sri Lanka, China and Hainan but widely cultivated in South-East Asia and some parts of the United States and Australia. It grows throughout India up to the height of 1500 to 1655m from sea level and in the Andaman Islands.

##### Morphological characteristics

Leaves are pinnate, exstipulate, having reticulate venation and having ovate lanceolate with an oblique base, 30 with 11-21 leaflets whose size description is each leaflet is 0.79–1.57inch long and 0.39–0.79 inch broad.

##### Chemical constituents

Curry leaves are high in volatile essential oils (saponin, sesquiterpenes, and monoterpenes), carotene, Formulation And Evaluation Of Herbal Shampo

folic acid, riboflavin. The oils from the curry leaves were found to contain mostly oxygenated monoterpenes. Using GC and GC-MS 33 constituents were found with linalool (32.83%), elemol (7.44%), geranyl acetate (6.18%), myrcene (6.12%), allo-ocimene (5.02),  $\alpha$ -terpinene (4.9%), and (E)- $\beta$ -ocimene (3.68%) as the main compounds.

##### Uses

Acts as Powerful antioxidant, may reduce the risk of cancer, reduces risk of heart diseases, helps in the management of diabetes, help deal with stomach ailments, effective against morning sickness. The rich nutrients in curry leaves can help prevent thinning hair or hair loss. The leaves may also help remove dead hair follicles, which can interfere with hair growth.

#### 5. Ginger

**Synonym:** Amber, Bay, Beige, Bister

**Biological source:** Ginger is obtained from the rhizomes of *Zingiber officinale*, belonging to the family Zingiberaceae.

##### Geographical source:

It is originated from Jamaica, South India (Cochin), Japan.

**Morphological characteristics;**


The plant of ginger is a perennial herb about 1-meter-high sympodial branching rhizome. For cultivation the rhizome is cut into pieces and each piece containing a bud is planted into trenches in well-drained and loamy soil in March or April. General appearance: Sympodial branching, horizontal rhizome. Size – Length 5-15 cm; width (height) 3 to 6 cm; thickness 0.5 to 1.5 cm. Shape – Laterally flattened on the upper side with short flattened oblique, obviate branches or fingers. Each branch is 1 to 3 cm long and at its apex shows a depressed scar of the stem.

*Chemical Constituents:*

Ginger contains 1 to 2% volatile oil, 5 to 8% pungent principle, resinous mass and starch. Volatile oil is responsible for the aromatic smell and consists of zingiberene 6% sesquiterpenes hydrocarbon zingiberol a sesquiterpenes alcohol and bisabolene. Gingerol is a yellow pungent oily liquid and yields gingerone a ketone and aliphatic aldehyde. Shogaol is formed by loss of water from gingerol. Shogaol and gingerone.



Sr.no	Common name	Picture	Biological name	Part used	Uses
01.	Pomegranate		<i>Punica granatum</i>	Peel	Act as an Anti-dandruff agent, darken hair colour, improves blood flow to the hair.
02.	Aloe vera		<i>Aloe barbadensis miller</i>	Leaves	It helps in thickening of hair, also helps to nourish hair and act as a good moisturizer.
03.	Reetha		<i>sapindus mukorossi</i>	Fruit	Act as a natural detergent, antidandruff agent, reduces dryness of hair, also provides conditioning effect.
04.	Curry leaves		<i>Murraya koenigii</i>	Leaves	It helps to remove dead hair follicles, which can be reason behind its anti-dandruff property. Curry leaves are rich source of Vitamin B, which help to restore hair color.
05.	Ginger		<i>Zingiber officinale</i>	Root	Acta as a natural antiseptic that controls scalp problems, gingerol relax blood vessels and thereby improve the circulation of blood, nourishment of hair follicles, ensuring faster hair growth.
06.	Orange Oil		<i>Citrus sinensis</i>	Leaves and Flowers	Lift your mood or reduce stress. Treat skin conditions such as acne. Reduce pain or inflammation. Relieve stomach upset.

07.	Tragacanth Gum		<i>Gond</i> <i>Katira</i>	The sap-like material of the bark	Powders using tragacanth as a basis were sometimes called diatragacanth. As a mucilage or paste, it has been used as a topical treatment for burns. It is used in pharmaceuticals and foods as an emulsifier, thickener, stabilizer, and texturant additive
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are less pungent. The pungency of gingerol and ginger is destroyed, when boiled with 5% potassium hydroxide or other alkalis. Formulation And Evaluation Of Herbal Shampoo

**Uses:** Ginger is stomachic, stimulant and aromatic carminative. It is used more as a spice. Ginger oil is used in mouth washes, ginger beverages and liquors. It is used as flavoring agent. Ginger powder has been reported to be effective in motion sickness.

#### EXCIPIENT PROFILE:

##### GELATIN:

Also called as gel foam, Gelatina. As a protein, chemically, it contains different amino acids out of which major is lysine.

It is composed of gluten protein. It is used as vehicle.

##### LEMON JUICE:

**Biological source:** Lemon is the fruit of *Citrus limon L* belonging to the family Rutaceae.

**constituents:** Phenolic compounds like flavonoids- Diosmin, Hesperidin, Limocitrin. Phenolic acids: Ferulic, Synapic, Para-hydroxy benzoic acid, Monoterpenoids: D-Limonene, Beta-pinene, Gamma terpinene, Vitamin-C.

**Uses:** Anti-inflammatory, Antimicrobial, Anticancer, and Antiparasitic activity.

##### SODIUM LAURYL SULFATE:

It is used as a surfactant. Sodium lauryl sulfate (SLS), also known as sodium dodecyl sulfate, is an anionic surfactant commonly used as an emulsifying cleaning agent. The purpose of these sulfates is to create a lathering effect to remove oil and dirt from your hair.

##### TRAGACANTH GUM :

**Synonyms:** gummi tragacanthae" (Latin), "Syrian tragacanth," "gum dragon," and "gond katira".

**Biological Source:** The dried sap of several species of the Astragalus genus, particularly Astragalus gummifer.

**Chemical Constituents:** The water-soluble part of guar gum contains mainly of a high molecular weight hydrocolloidal polysaccharide, that is, galactomannan, which is commonly known as guaran. The gum also contains about 5–7% of proteins.

**Uses:** Powders using tragacanth as a basis were sometimes called diatragacanth. As a mucilage or paste, it has been used as a topical treatment for burns. It is used in pharmaceuticals and foods as an emulsifier, thickener, stabilizer, and texturant additive.

### **GLYCERIN:**

Mainly obtained from the animal and plant fats. Glycerin is a common ingredient in pharmaceutical drugs, including heart medication, suppositories, cough remedies and anesthetics. Glycerin is a coveted ingredient in skin, hair, and body care products because of its humectant properties, it can draw in moisture from the atmosphere and retain it in hair and skin. Glycerin moisturizes the scalp

and promotes healthy hair.

### **ORANGE OIL**

Contains high content of linalool and linalyl acetate, a moderate amount of terpinene-4-ol, lavandulyl acetate, and lavandulol, and variable levels of eucalyptol (1,8-cineol) and camphor.

**Uses:** It helps promote hair growth. Lavender essential oil recently gained attention for stimulating hair growth. It helps to prevent or kill head lice, may help to curb skin inflammation. It has a calming effect and divine fragrance. Formulation And Evaluation Of Herbal Shampoo

### **CHARCOAL**

Charcoal has a range of benefits for hair, in that it exfoliates and detoxifies, removing oil, grime and buildup. It can also be used on those with itchy scalps. Deep cleansing, Charcoal often shows up in "detoxifying" products or products meant to allow the hair a reset moment.

### **RESEARCH**

### **GOALS**

The primary goal of this study is to develop and assess herbal shampoo for the elimination of oil or dirt without causing harmful side effects. technique: Water and alcohol were macerated in order to perform the extraction technique. Several reagents were used for phytochemical screening, and all of the extracts, gelatine, lemon juice, glycerine, vitamin E capsules, charcoal, SLS, and essential oil were combined to create the herbal shampoo.

### **Result:**

We tested each extract using a variety of phytochemical techniques, and each test produced positive results. The formulation underwent evaluation testing, which included visual inspection, pH determination, foaming ability, surface tension, wetting ability, and solid content tests. The herbal shampoo is safe to use and passed every assessment test.

**In conclusion**, the designed shampoo contains antidandruff properties, strengthens hair growth, and significantly minimises hair loss during combing. The created shampoo is safer than the commercially available synthetic shampoo, and its pH was set to 6 to prevent irritation.

**Key Words:** Herbal Shampoo, Pomegranate, Ginger, Aloe vera, Curry patta powder, Reetha

## **1. MATERIALS AND METHODS**

The gathering of plant material

The chosen plant material was gathered from the neighbourhood marketplace. The sample was identified and authenticated

## 2. EXTRACTION

The extraction of drug was carried through maceration technique. About 50g of pomegranate peel powder was separately soaked in 250 ml of methanol as a solvent. This sample was incubated at 37°C for about 24 h in an incubator. After this the sample was filtered with Whatman no.1 filter paper. Later the filtrate of plant material was evaporated at room temperature using heating mantle. Collect the obtained extract and store in a cool place.

5g of Curry patta powder, 5g of Ginger water, 10g of Aloe vera gel, 20g of Reetha were mixed with 100 ml water in beaker. The mixture was kept for boiling until the water reduced to one quarter. It was then filtered. The clear extract obtained was used as herbal extract

## 3. PHYTOCHEMICAL SCREENING: Chemical tests for detection of organic constituents

### TEST FOR REDUCING SUGARS

**a) Fehling's test:** Mix 1ml Fehling's A and 1ml Fehling's B solutions, boil for one minute. Add equal volume of test solution. Heat in boiling water bath for 5-10 min. First yellow, then brick red ppt is observed.

**b) Benedict's test:** Mix equal volume of Benedict's reagent and test solution in test tube. Heat in boiling water bath for 5 min. Solution appears green, yellow or red depending on amount of reducing sugar present in test solution.

### TEST FOR NON-REDUCING POLYSACCHARIDES (STARCH)

**a) Iodine test:** Mix 3ml test solution and few drops of dilute iodine solution. Blue colour appears. It disappears on boiling and reappears on cooling.

**b) Tannic acid test for starch:** with 20% tannic acid test solution gives ppt.

### Creation

Curry patta aqueous extract, ginger water, aloe vera, Reetha, and pomegranate peel powder alcoholic extract were combined in a specific quantity to create herbal shampoo. The mixture was then mixed with a 10% gelatine solution using a magnetic stirrer since the gelatine exhibits pseudoplastic behaviour and makes a clear solution. Using 0.1 M NaCl, an SLS (75%) solution was made to provide thickness to the formulation. Guar gum extract was added as a binder and glycerin was used as a moisturizer. To improve aroma in the formulation, sufficient quantity of essential oil (lavender) was added. The shampoo also included one capsule of Vitamin E for conditioning, activated charcoal for color and 2 ml of lemon juice as preservative.

## EVALUATION OF FORMULATED SHAMPOO

To evaluate the quality of prepared formulations several quality-controlled tests including visual assessment, physicochemical controls, in performance tests were performed.

### 1. Physical appearance/ visual inspections:

The formulation prepared was evaluated for the clarity, colour, odor and foam producing ability.

### 2. pH:

The pH 10% v/v shampoo solution in distilled water was measured by using pH meter at room temperature.

Neutral pH=7, Acidic pH <7, Basic pH >7.

### 3. Determination of % of solid contents:

4 grams of shampoo were placed in a previously clean, dry and weighed evaporating dish. The dish and

shampoo were weighed again to confirm the exact weight of the shampoo.

The liquid portion of the shampoo was evaporated by placing evaporating dish on the hot plate. The weight and thus % of the solid contents of shampoo left after complete drying was calculated.

#### 4. Surface tension measurement: By Drop count method.

Determination of number of drops:

1. Select a clean stalagmometer, fix firmly in vertical position and suck the water through the rubber tube to a level higher than the upper mark.
2. Leave the rubber tube and allow water to flow down.
3. Start counting of drops when water meniscus just passes the upper mark, when water passes the lower mark stop counting and note the number of drops is satisfied.

#### 5. Test to evaluate foaming ability and foam stability:

Foaming ability was determined by using cylinder shake method. Take 50 ml of the 1% formulated shampoo solution was placed into a 100ml graduated cylinder and covered with one hand and shaken 10 times. The total volume of the foam content after one min of shaking was recorded.

Foam stability was evaluated by recording foam volume after 1 minute and 4 minutes of shaken test.

#### 6. Wetting time test:

A canvas paper was cut into 1 inch diameter discs having an average weight of 0.44g. The smooth surface of disc was placed on the surface of 1% v/v shampoo solution and the stopwatch started. The time required for the disc to begin to sink was noted down as the wetting time.

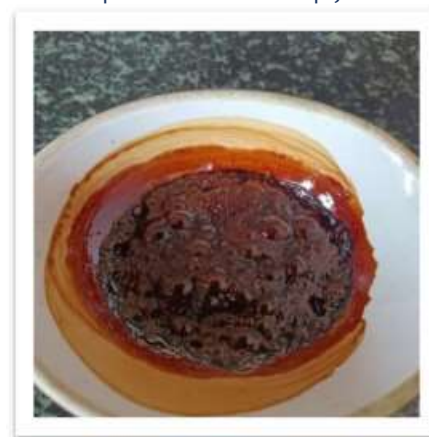
### SUMMARY

Shampoo made of herbal ingredients is one of the cosmetics used to wash away hair debris. Shampoos are sticky solution detergents that contain the right active components, additives, and preservatives. The natural origin of herbal shampoo, which is protective, boosts consumer demand, and has few negative effects, makes it trendy. Many shampoo formulations are linked to hair quality, hair care practices, and specific issues including treating dandruff, oily hair, and androgenic alopecia. Shampoos are liquid, creamy or gel like preparations<sup>10</sup>. Hair care items could be defined as the preparation which is meant for removal of dirt, excessive oil, dandruff from the hair and

scalp. Hair care products also provide nourishment to the hair and giving the healthy look to hairs. The real technology of cleaning the hair and scalp were developed in this century by the introduction of cake soap which was followed by the production of shampoo products<sup>11</sup>. A shampoo is product of a surfactant in a suitable form of either liquid, solid or Powder, which is used under the specific conditions to remove surface oil, dirt and skin debris from the hair shaft without adversely causing the customers. Hairs are the essential part of human beauty

### CONCLUSION AND OUTCOMES

The purpose of the current study was to create a herbal shampoo that lessens dandruff, greying, and hair loss during combing. In addition to strengthening hair, encouraging hair development, and having conditioning properties, the prepared herbal shampoo was safer than chemical conditioning agents. Herbal shampoo was formulated with the aqueous extracts and alcohol extract of medicinal plants that are traditionally used for cleansing of hair. The use of artificial conditioning chemicals induces hair loss by lowering the amount of protein in the hair. So, herbal shampoo will provide the effective conditioning effect. The natural agents in herbal shampoo have good cleansing properties that contribute to the stability, impart softness, prevents problems associated with hairs such as dandruff, greasy hair, split ends etc.



Pomegranate, ginger, aloe vera, curry patta powder, and Reetha plant extracts are used in this study as place of artificial cationic conditioners. The goal of this study was to create a shampoo that is stable, functional, and effective while avoiding all synthetic ingredients that are typically used in formulas of this kind. Lastly, we performed a number of evaluation measures to assess the effectiveness of herbal shampoo. The evaluation study's findings for the created shampoo's safety and quality control tests were similar. However, this herbal shampoo still need additional validation.

## RESULTS AND DISCUSSION

### EXTRACTION

We boiled 100 millilitres of water with 5 grammes of curry patta powder, 5 millilitres of ginger water, 10 grammes of aloe vera gel, and 20 grammes of reetha powder until the water dropped to  $\frac{1}{4}$  of the original volume. The dark green semi-solid extract should be filtered and collected. Ten grammes of ginger were boiled in one hundred millilitres of water to create ginger water.

Plant	Parts	Quantity for 100ml
Curry patta	Dried leaves	5%
Ginger	Root	5%
Aloe vera	Leaves	10%
Reetha	Fruit	20%

**Table 02: Extraction**

Pomegranate peel power was extracted by taking 50g in 250ml of alcohol by **maceration** method. The yield of drug extract after evaporation was 11.3g, which was appeared as **crimson red color**.

**Step 01: Filtration    Step 02: Extraction    Step 03: Final extract**

**(Figure: 01)**

### PHYTOCHEMICAL SCREENING

Phytochemical screening was done for each extract to test the presence of phytochemicals present and the results are given below in the table.

**Table 03: Chemical tests**

Test	Test name	Pomegranate	Ginger	Aloe vera	Curry leaves	Reetha
Reducing sugar	Fehling's test	+	+	-	+	-
	Benedicts test	+	+	+	+	-
Non-reducing polysaccharides	Iodine test	-	-	-	-	-
	Tannic acid test	-	-	-	-	+
Proteins	Biuret test	+	+	+	+	+
	Millions test	+	+	+	+	+
Amino acid	Ninhydrin test	-	+	+	+	+
	Test for cysteine	-	+	+	+	+
	Test for tyrosine	-	+	+	+	-
Anthraquinone glycosides	Bontrager's test	+	+	+	+	+
Saponin glycosides	Foam test	+	+	+	+	++
Tannins and phenolic compounds	5% FeCl <sub>3</sub> solution	+	+	-	-	-
	Lead acetate solution	-	+	+	+	-
	Potassium dichromate solution	-	-	-	-	-
	Acetic acid solution	-	-	-	-	-
	Dilute iodine solution	-	-	-	-	-
	Potassium permanganate (Dilute)	-	-	-	-	-
Alkaloids	Wagner's test	+	+	+	+	+
	Mayer's test	+	+	+	+	+

+	Positive result
-	Negative result

## FORMULATION

Herbal shampoo was formulated by mixing aqueous extract of Curry patta, Ginger water, aloe vera, Reetha and alcoholic extract of pomegranate peel powder in a defined amount to 10% gelatin solution which is mixed in a magnetic stirrer as it shows pseudoplastic behavior and forms clear solution. Curry leaves treats the damaged hair by scalp restoration, Pomegranate peel powder prevent dandruff and darken hair color, Ginger has essential fatty acids which prevent hair from thinning, Reetha acts as foaming agent, and Aloe vera helps in hair thickening. To increase the thickness of formulation, SLS (75%) solution was prepared using 0.1 M NaCl. Guar gum extract was added to increase viscosity and glycerin was used as a moisturizer. To improve aroma in the formulation, sufficient quantity of essential oil (lavender) was added. The shampoo also included one capsule of Vitamin E for conditioning, activated charcoal for color and 2 ml of lemon juice as preservative. Before preparing final formulation, we prepared five formulations with different concentration of each drug. The first formulation was found to be accurate, so we used the first formula and prepared final formulation for 100 ml.

**Table 04: Different formulations**

Materials	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>5</sub>
Herbal extract (pomegranate)	0.2g	0.4g	0.6g	0.8g	1g
Herbal extract (Curry power , Ginger, Reetha, Aloe vera)	2ml	4ml	6ml	8ml	10ml
SLS	1g	2g	3g	4g	5g
Sodium chloride	1g	2g	3g	4g	5g
Gaur gum	0.5g	1g	1.5g	2g	2.5g
Glycerin	0.5ml	1ml	1.5ml	2ml	2.5ml
Vitamin-E capsule	1	1	1	1	1
Lemon juice	2ml	2ml	2ml	2ml	2ml
Essential oil	Q. S	Q. S	Q. S	Q. S	Q. S
Charcoal	Q. S	Q. S	Q. S	Q. S	Q. S
Gelatin solution	Up to 100ml	Up to 100ml	Up to 100ml	Up to 100ml	Up to 100ml



**Table 05: Final formulation**

Sl.no	Materials	Final formulation
01.	Herbal extract (pomegranate)	0.2g
02.	Herbal extract (Curry patta power, Ginger, Aloe vera, Reetha)	2ml
03.	SLS	1g
04.	Sodium chloride	1g
05.	Gaur gum	0.5g
06.	Glycerin	0.5ml
07.	Vitamin E capsule	1
08.	Lemon juice	2ml
09.	Essential oil	Q. S
10.	Charcoal	Q. S
11.	Gelatin solution	Up to 100ml

## EVALUATION

### 1. Physical appearance

The formulation prepared was evaluated for physical appearance and the results are given below in the table.

**Table 06: physical parameters**

Sl.no	Parameters	Result
1	State	Liquid
2	Color	Brownish green
3	Odor	Characteristic

### 2. pH

The pH of the shampoo solution was determined in room temperature by using pH paper and the pH was found to be 6.



(Figure: 03)

### 3. Surface tension measurement

Surface tension was determined by number of drops method by using stalagmometer and the result was found to be **35.85 N/m**

Calculation:

No of drops of water =39

No of drops of liquid shampoo = 19

Density of water =1.344 g/cm<sup>3</sup>

Density of liquid shampoo =1.348 g/cm<sup>3</sup>

Surface tension of water =72.8 dynes/cm

$= (39 \times 1.344 \setminus 19 \times 1.348) \times 72.8 = 35.85 \text{ N/m}$

### 4. Wetting time

The wetting ability of the shampoo was determined using canvas disc method and the wetting time of the shampoo was found to be 32 seconds.



(Figure: 04)

### 5. Foaming ability and foaming stability

Foaming is very important parameter in evaluation of shampoo. The formulated shampoo produced the foam volume above 10ml and the shampoo had 4ml foam volume for about 1 hour showing that the foam has good stability.



(Figure: 05)

### 6. Solid content test

The solid content of the tested shampoo was found to be 0.31g and was expected to wash out.



(Figure: 06)

**Table 07: Evaluation results**

Sl.no	Evaluation tests	Results
01.	Physical appearance	Brownish green liquid
02.	pH	6
03.	Surface tension measurement	35.85 N/m
04.	Wetting time	32 seconds
05.	Foaming ability and stability	Up to 4ml
06.	Solid content test	0.31g

### DEMONSTRATION

**Before wash****Application of oil****Application of herbal shampoo****Washing hands****After wash****(Figure: 07)****REFERENCES**

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