

# PREPARATION AND EVOLUTION OF HERBAL POWDERD SHAMPOO

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## ABSTRACT

*From the ancient times India/Bharat is known for their discoveries of different herbal products for human health. They know that hair dandruff would be major problem for men and women. In modern science show that dandruff is cause by **Malassezia fungus** but also it can be occurred due to stress oily, skin, dry skin, lack of cleaning. In market there are many products are available for dandruff but they are deep with chemical which can be harmful in future. But our ancients' gurus showing that herbs can be very effective for treatment of scalp and other hair problems. An herbal herbs and shrubs for hair maintaining mostly are **Amla, Bhringraj, Reetha, Hibiscus, Neem, Tulsi and Ginger**. Shikakai mainly used for growth and natural black colour of hair. The herbal powder antidandruff shampoo takes a holistic approach by harnessing the power of natural ingredient known for their dandruff fighting properties. The formulation of the herbal powder antidandruff shampoo typically involves grinding or processing these natural ingredients into a fine powder. This shampoo is able to remove excess oil, dead skin cells, dandruff flakes effectively. By utilising herbal ingredients, the shampoo provides hood alternative for the chemical laden shampoo. The formulation of the herbal powder antidandruff shampoo typically involves grinding or processing these natural ingredients into a fine powder. This powder is then mixed with other gentle cleansing agents and herbal extracts to create a shampoo that effectively removes excess oil, dead skin cells, and dandruff flakes from the scalp while promoting a healthy scalp environment.*

**Keyword:** Herbs<sup>1</sup>, powder shampoo<sup>2</sup>, antidandruff<sup>3</sup>, Amla<sup>4</sup>, Bhringraj<sup>5</sup>, Reetha<sup>6</sup>, Hibiscus<sup>7</sup>, Neem<sup>8</sup>, Tulsi<sup>9</sup> Ginger<sup>10</sup>.

## 1. INTRODUCTION

Hair is an important part of the body appeal and its look is a health indicator. The treatment of hair and scalp, primarily, involved the use of shampoo for an effective, but gentle cleansing; however, for years, the shampoo is considered not only as a cosmetic product having the purifying purpose, but it is also responsible for maintaining the health and the beauty of hair, imparting gloss and improving manageability. [1] **Shampoo is a hair care product used for the removal of oils, dirt, skin particles, dandruff, environmental pollutants and other contaminant particles that gradually build up in hair** [2]. Now-a-days many synthetic, herbal, medicated and non-medicated shampoos are available in the market but popularity of herbal shampoo among consumers is on rise because of their belief that these products being of natural origin are safe and free from side effects [3] Synthetic surfactants are added to shampoo primarily for the foaming and cleansing action but their regular use leads to dryness of hairs, hair loss, irritation to scalp and eyes [4] Herbal formulations are considered as alternative to synthetic shampoo [5] Hair care has started very early in human civilization around 4000 BC using animal fats and plant oil. however, shampoo was introduced only in late nineteenth century and has become very popular product globally since then. In India herbs were used for hair care even in early 19th century. Present study provides the basic information by conducting survey suggesting that there will be an acceptance of scientifically designed herbal shampoo in the market. [6]

The concept of shampooing hair can be traced back to ancient civilizations such as the Babylonians, who used soap-like materials made from boiled fats and ashes to clean their hair. However, modern shampoo as we know it today was first commercially produced in the early 20th century [7] According to Downing, the word "shampoo" comes from the Hindi word "chāmpo," which means to knead or massage the head. In India, a traditional hair treatment involved massaging the scalp with oils and herbs to cleanse and condition the hair. British colonizers in India adopted this practice and brought it back to Europe in the 18th century. In the early 20th century, shampoo began to be mass-produced and marketed as a consumer product. The first commercial shampoo was created in 1903 by Kasey Hebert, who combined the traditional Indian ingredients of sapindus fruit, tea, and eucalyptus oil to create a liquid shampoo. [8]

## TYPES OF SHAMPOO

Shampoos are divided into the following broad categories:

1. Powder Shampoo
2. Liquid Shampoo
3. Lotion Shampoo
4. Cream Shampoo
5. Jelly Shampoo
6. Aerosol Shampoo
7. Specialized Shampoo
8. Conditioning Shampoo
9. Anti-dandruff Shampoo
10. Baby Shampoo
11. Bi-layer Shampoo [9]

### ❖ Powdered shampoo

"Powdered shampoo is a natural and eco-friendly alternative to traditional liquid shampoos. It is typically made from natural ingredients such as herbs, plant extracts, and clays, which are known for their cleansing and conditioning properties. Unlike liquid shampoos, which are often packaged in plastic bottles and contain preservatives and chemicals, powdered shampoo can be made at home using simple ingredients and packaged in recyclable or compostable materials.

One of the main benefits of powdered shampoo is that it is gentle on the hair and scalp. Because it is made from natural ingredients and contains fewer preservatives and chemicals than liquid shampoos, it is less likely to cause irritation, dryness, or other issues. Additionally, powdered shampoo can be customized to your specific hair type and needs, by adjusting the ingredients and ratios of the formula.

Overall, powdered shampoo is a natural, eco-friendly, and customizable option for hair care. By making your own powdered shampoo at home, you can reduce your environmental impact, save money, and enjoy the benefits of natural ingredients on your hair and scalp." [10]

### Advantages

#### 1. Less toxic

powdered shampoos were found to have lower toxicity levels than traditional liquid shampoos, which often contain synthetic preservatives and chemicals that can be harmful to human health and the environment.

#### 2. Long shelf life

powdered shampoos have a longer shelf life. Because they do not contain water, they are less susceptible to bacterial growth and spoilage, and can be stored for longer periods of time without losing their efficacy or quality. [11]

3. **Powdered shampoo is Natural.** It is typically made from natural ingredients such as herbs, grains, and clays, which have been used for centuries for their cleansing and conditioning properties. Powdered shampoo is also customizable, allowing you to tailor the formula to your specific hair type and needs.

#### 4. Can be made at home using simple ingredients,

reducing your environmental impact and eliminating the need for plastic packaging. Additionally, powdered shampoo is cost-effective, as it can be made in small batches and stored for extended periods of time without spoilage or deterioration [10]

#### 5. Vitmin Rich

Powdered shampoos are typically made from natural ingredients such as herbs, clays, and grains, which are rich in vitamins, minerals, and other nutrients that nourish and strengthen the hair and scalp. For example, herbs such as neem, amla, and shikakai have been used for centuries in India for their antibacterial, antifungal, and anti-inflammatory properties, which can help prevent dandruff, scalp irritation, and hair loss. Clay powders such as bentonite and kaolin are rich in minerals that can help detoxify the scalp and remove excess oils, dirt, and build up, resulting in cleaner and healthier hair.

#### 6. Can be for Specific use

You can add ingredients such as coconut milk, honey, or avocado oil to your powdered shampoo formula to provide extra moisture and nourishment. If you have oily hair or dandruff, you can add tea tree oil, neem powder, or apple cider vinegar to your formula to help balance the scalp's pH and reduce inflammation and irritation. [12]

#### ❖ Scope

Powdered herbal antidandruff shampoo can be effective in treating a range of scalp conditions, including dandruff, oily scalp, and fungal infections. It is gentle on the scalp and does not strip the hair of its natural oils, which can help to prevent dryness and breakage. Powdered herbal antidandruff shampoo can be used on a regular basis without causing any harmful side effects. It can be easily modified to address specific hair concerns by adding or subtracting ingredients. Powdered herbal antidandruff shampoo is a sustainable and eco-friendly option that can reduce the use of plastic packaging and harmful chemicals. [13]

#### ❖ Significance:

Dandruff is a common scalp condition that affects many people. It can cause scalp irritation, itching, and flaking, which can be embarrassing and uncomfortable. Many commercial dandruff shampoos contain harsh chemicals that can damage the scalp and hair over time. Powdered herbal antidandruff shampoo offers a natural and gentle solution to dandruff, without the use of harsh chemicals or synthetic ingredients. The natural ingredients in powdered herbal antidandruff shampoo can help soothe and moisturize the scalp, reduce inflammation, and prevent the growth of dandruff-causing bacteria and fungi. Powdered herbal antidandruff shampoo can also improve the overall health and appearance of the hair, leaving it clean, shiny, and manageable. [14]

Symptoms of dandruff mainly include Presence of fragments, Itching of the scalp, and Redness around the scalp. Dandruff can be treated in two ways. They include chemical based antidandruff shampoo and herbal based antidandruff shampoo containing antibacterial and antifungal ingredients like ketaconazole, selenium sulfide, zinc pyrithione etc. The anti-dandruff shampoo only slow down the scalp flaking and have their own disadvantages like loss of hair, increased scaling, itching, irritation, nausea, headache, vomiting, photosensitivity. Herbal extracts formulations are viable alternative to synthetic drugs. Now-adays, many herbal shampoos are available in the market which contains herbal ingredients such as plant extracts and essential oils. In the present review we discuss about the causes, synthetic chemical, various herbs and the evaluation parameters for the anti-dandruff shampoo. [15]

There are main two type of factor that may lead to dandruff-causing

#### 1. Microbial factor

- 1) Fungal: *Malassezia furfur* is considered as the leading cause of dandruff.
- 2) Bacterial: Disequilibrium in the proportion of the two main bacterial populations found on scalp *Propionibacterium acnes* and *Staphylococcus epidermidis* may also be a cause of dandruff.

**2. Non microbial factor**

- 1) Damage to the scalp Stratum corneum.
- 2) Individual susceptibility to Oleic acid.
- 3) Dry scalp.
- 4) Oily or irritated skin.
- 5) Dirt accumulation due to less frequent
- 6) Shampooing
- 7) Sensitivity to hair cosmetics.
- 8) Other scalp conditions like psoriasis, eczema etc. [16]

**LITERATURE REVIEW**

<b>Author</b>	<b>Title</b>	<b>Year</b>	<b>Publication</b>
Sachin Dubey* Neelesh Nema,*and S. Nayak**	Preparation and Evaluation of Herbal Shampoo Powder	2004	Ancient Science of Life
reethi P. Jaya, Padmini K., Srikanth J., Lohita M., Swetha K., Rao P. Vengal	A Review on Herbal Shampoo and Its Evaluation	2013	Asian Journal of Pharmaceutical Analysis
Wani Snehal* , Khot Nitin2 and Buchake Vaibhav	PREPARATION & EVALUATION OF ANTIDANDRUFF POLYHERBAL POWDER SHAMPOO	2014	Pharmacophore
Potluri Anusha, Shaheda S.K. Asma, Rallapally Neeharika, Durriel S., Harish G	A Review on Herbs Used In Anti-Dandruff Shampoo and Its Evaluation Parameters	2013	Resound Jours of Topcal and Cosmetic Sconces
S. Mohamed Halith, A. Abirami *, S. Jayaprakash, Chitra Karthikeyini, K. Kulathuran Pillai, P. U. Mohamed Firthouse.	Effect of Ocimum sanctum and Azadiracta indica on the formulation of antidandruff herbal shampoo powder	2009	Scholars Research Library
Sutar Manisha*, Deshmukh Swati , Chavan Manisha, Singh Sonia	PREPARATION AND EVALUATION OF POLYHERBAL SHAMPOOPOWDER	2013	International Journal of Pharmacy and Biological Sciences
Sachin Gholvel *, Sachin Nadarge1 , Sunil Hindole1 , Omprakash Bhusnure1 , Pratap Bhosale2 and Sanjay Thonte	FORMULATION AND EVALUATION OF FPOLYHERBAL ANTIDANDRUFF POWDERSHAMPOO	2015	World Journal of Pharmaceutical Research



## **Formulation**

### **1. Selection of Components**

Medicinal plants are rich in antioxidants, known to treat different diseases. The antioxidant potential is tested at various levels [17]. Preparations used in hair care are available in the form of creams, dyes, pomades, powders, tonics, *etc.* [18] Hence, the knowledge from Ayurveda and herbals will be enhanced by information on the evidence-basis of these plants [19]. Drugs from the herb resources are quickly accessible, cheap, safe, efficient and rarely have side effects [20]. The need for herb based natural medicines is vastly increasing due to the lack of side effects and natural goodness [21] The underlying research deals with the preparation and assessment of Poly-herbal anti-dandruff formulation containing the goodness of **Amla, Bhringraj, Reetha, Hibiscus, Neem, Tulsi and Ginger.** [22]

#### **1.1. AMLA**

Amla (*Emblica officinalis*) (EO) has a hallowed position in Ayurveda- an Indian indigenous system of medicine. According to belief in Indian mythology, Amla is the first tree to be created in the universe; which belongs to the family of Euphorbiaceae and is also known as *Phyllanthus emblica* or Indian gooseberry. Amla is native to India and also grows in tropical and subtropical regions of Pakistan, Uzbekistan, Sri Lanka, South East Asia, China and Malaysia [23]. The fruits of Amla are widely used in the Ayurvedic preparation and are believed to increase defence against diseases [24]. It has a beneficial role in degenerative diseases like cancer, diabetes, liver treatment, ulcer, anemia, heart trouble and also is an important constituent in hepatoprotective formulas available. Amla is highly nutritious and is one of the richest sources of vitamin-C, amino acids and minerals [25].

It contains several chemical constituents like tannins, alkaloids and phenols.4 among all hydrolysable tannins, Emblicanin A and B; gallic acid, ellagic acid are reported to possess biological activity. Almost all parts possess medicinal properties, particularly fruit, which has been used in Ayurveda as a powerful rasayana and in customary medicine in the treatment of diarrhoea, jaundice, inflammation and several other ailments [26].



#### **➤ CLASSIFICATION**

- ❖ Biological name :
- ❖ Kingdom : plantae
- ❖ Division : Angiospermae
- ❖ Class : Dicotyledonae
- ❖ Order : geraniales
- ❖ Family : euphorbiaceae
- ❖ Genus : Emblica
- ❖ Species: officinalis Geartn.
- ❖ Vernacular names English: Emblic myrobalan
- ❖ Indian Goose berry
- ❖ Sanskrit: Aamalaki
- ❖ Hindi: Amla

- **MORPHOLOGY:-** Amla tree is a small to medium sized deciduous tree with an average height of 8-18 m, with thin light grey bark exfoliating in small thin irregular flakes, exposing the fresh surface of a different color underneath the older bark. The average girth of the main stem is 70 cm. In most cases, the main trunk is divided into 2 to 7 scaffolds very near to the base [27] . Leaves are 10 -13 mm long, 3 mm wide, closely set in pinnate faishon3 which makes the branches feathery in general appearance. After setting of the fruits leaves develop. Flowers are unisexual, 4 to 5 mm in length [28] , pale green in color, borne in leaf axils in clusters of 6 to 10. Fruits are fleshy, almost depressed to globose shape, 2.1-2.4 cm in diameter, 5.3-5.7 g in weight, 4.5-5.0 mL in volume. The stone of the fruit is 6 ribbed, splitting into three segments [28] each containing usually two seeds; seeds are 4-5 mm long and 2-3 mm wide, each weighing 572 to 590 mg [29] [28]
- **CHEMICAL CONSTITUENTS:** - Amla known as source of vitamin C. Powdered amla is used as a gooseberry. Amla is a rich essential ingredient in hair tonic to promote hair growth and improve hair pigmentation. It strengthens and nourishes the roots, improves the colour and radiance. Applying amla oil to the roots of hair improves hair growth and colour. A very popular application is to reduce baldness and hair loss. This quality is due to the tannin content in the form of antioxidants. [30]

## **1.2. BHRINGRAJ: -**

Baringa shampoo is an herbal shampoo that is becoming increasingly popular due to its many benefits for hair health. The shampoo is made using extracts of the bhringraj herb, which is known for its medicinal properties in Ayurvedic medicine. Here are some of the benefits of using bhringraj shampoo for hair:

### ✓ **Promotes Hair Growth**

Bhringraj is known to improve blood circulation in the scalp, which can stimulate hair growth. A study conducted on rats found that the use of bhringraj oil increased the number of hair follicles and the rate of hair growth [31]



### ✓ **Reduces Hair Fall:**

Bhringraj is believed to strengthen hair roots, which in turn can reduce hair fall. A study conducted on human volunteers found that the use of bhringraj oil reduced hair fall by 42% [32]

### ✓ **Prevents Dandruff:**

Bhringraj has anti-fungal properties that can help prevent dandruff. A study conducted on human volunteers found that the use of bhringraj oil reduced the severity of dandruff [33]

### ✓ **Improves Hair Texture:**

Bhringraj is rich in nutrients such as iron, calcium, magnesium, and vitamins B and E, which can help improve hair texture. A study conducted on rats found that the use of bhringraj oil improved hair texture and reduced hair damage [34]

### ➤ MORPHOLOGY

*E. alba* (L.) is an annual multibranched herbaceous plant that reaches up to the height of 30–50cm. The form of this plant may be erect or prostrate. The plant is covered with hair of white color. The hair is present on both the surfaces of leaves. The stem is of red colour. There is presence of simple, sessile, and lanceolate leaves which are of length 4–10 cm, breadth 0.8–2 cm, and tallness 90 cm with slender. The leaves are present in opposite manner which are attached to the stem. The plant is covered with flowers throughout the year. The fruiting period of *E. alba* is from September to October. [35]



### ➤ GEOGRAPHICAL DISTRIBUTION

It is found as a weed in tropical and subtropical regions of the world such as South America, Asia, and Africa at an altitude of up to 2000 m. It is found throughout India, China, Thailand, and Brazil, Taiwan, Indonesia, Japan, the Philippines, Bangladesh, and United States. In India, it is mainly found in states Assam, Bihar, Uttar Pradesh, and Manipur. [36]

### ➤ CHEMICAL CONSTITUENT

*E. alba* (Bhringraj) contains wide range of diverse phytochemical constituents which include coumestans, alkaloids, flavonoids, glycosides, polyacetylenes, and triterpenoids, phenolic acids, saponins, sterol, sesquiterpene lactones, proteins, amino acids, carbohydrates, and many more [37]

#### 1. Coumestans

Coumestans are the main active phytochemical constituents of *E. alba* which are the derivatives of coumarin. Wedelolactone, demethylwedelolactone, demethylwedelolactone-7-glucoside, isodemethylewedelolactone, and strychnolactone are the main coumestans present in the whole plant especially in the leaves. These are believed to be associated with anticancer properties

#### 2. Alkaloids

The major alkaloids present in *E. alba* leaves are (20S) (25S)- 22,26-imino-cholesta-5,22(N)-dien-3 $\beta$ -ol (verazine, 3). Other novel alkaloids reported are 20-epi-3-dehydroxy-3-oxo-5,6-dihydro-4,5-dehydroverazine (1), ecliptalbine [(20R)-20-pyridyl-cholesta-5-ene-3 $\beta$ ,23-diol] (4), (20R)-4 $\beta$ -hydroxyverazine (5), 4 $\beta$ -hydroxyverazine (6), (20R)-25 $\beta$ -hydroxyverazine (7), 25 $\beta$ hydroxyverazine and (8), Ecliptalbine (4). While methanolic extract of the plant contains alkaloids such as verazine, 20-epi-3-dehydroxy-3-oxo-5,6-dihydro-4,5-dehydroverazine ecliptalbine, (20R)-4shydroxyverazine, 4shydroxyverazine, (20R) 25s-hydroxyverazine, and 25shydroxyverazine. Some other reported alkaloids are ecliptine, nicotine, verazine, and dehydroverazine ecliptalbine.

#### 3. Saponin

Saponins are mainly associated with the cytotoxic activity. Eclalbatin, alpha-amyrin, ursolic acid, and oleanolic are novel triterpene saponin which has been isolated from the whole plant of *E. alba*. Eclalbatin, dasyscyphin C is present in the roots which are associated with the properties such as anticancer, antiviral, and antioxidant activity.

#### 4. Sterols

Stigmasterol, daucosterol, stigmasterol-3-O-glucoside, phytosterol, and  $\beta$ -glucoside of phytosterol are the major sterols present in *E. alba* seed. Stigmasterol is an important sterol which is involved in the process of synthesis of major reproductive hormones like progesterone, androgens, estrogens, and corticoids

#### 5. Flavonoids

Apigenin, luteolin and luteolin-7-glucoside, and orobol are the main flavonoids present in *E. alba*. Apigenin and luteolin are associated with the anti-cancer properties [64].

#### 6. Volatile oil

**Heptadecane**, 6,10,14-trimethyl-2-pentadecanone, n-hexadecanoic acid, pentadecane, eudesma-4(14),11-diene, phytol, octadec-9-enoic acid, 1,2-benzenedicarboxylic acid diisooctyl ester, (Z,Z)-9,12- octadecadienoic acid, (Z)-7,11-dimethyl-3-methylene-1,6,10- dodecatriene, (Z,Z,Z)-nt [38]

#### ➤ Classification

- Kingdom : Plantae
- Subkingdom : Viridaplantae
- Infrakingdom : Streptophyta
- Division : Tracheophyta
- Subdivision : Spermatophytina
- Infradivision : Angiospermae
- Class : Magnoliopsida
- Superorder : Asterales
- Order : Asterales
- Family : Asteraceae
- Genus : *Eclipta*
- Species : *alba*
- Common name : False Lily, Bhringraj

### 1.3. REETHA

*SAPINDUS (REETHA)* Sapindus encloses vitamin A, D, E, K Saponin, Sugars, Fatty acid and Mucilage. Reetha extract is useful for promote hair growth and reduce dandruff [16]. Extract of fruit coat works as natural shampoo: used in herbal shampoo as hair cleanser [39] *Sapindus mukorossi* (fam: Sapindaceae), well known as soapnuts, are used medicinally as an expectorant, emetic, contraceptive, and for treatment of excessive





salivation, epilepsy, chlorosis, and migranes. *Sapindus mukorossi* is a popular ingredient in Ayurvedic shampoos and cleansers.

They are used in Ayurvedic medicine for treatment of eczema, psoriasis, and for removing freckles. Soapnuts have gentle insecticidal properties and are traditionally used for removing lice from the scalp. *S. mukorossi* is a common plant available at various places in India. The plant is widely used in cosmetic preparation like shampoos and cleansers. It is reported to contain mainly oleanane, dammarane and tirucullane type saponins. The structures and chemical name of various saponins isolated from *S. mukorossi* have been compiled in the present review. The pharmacological studies reported in the present review confirm the therapeutic value of this plant. [40] It has many pharmacological activities like cytotoxic, insecticidal activities.

#### ➤ MORPHOLOGY

It is a fairly large, deciduous tree, usually up to 12 m in height, sometimes attaining a height of 20 m and a girth of 1.8 m, with a globose crown and rather fine leathery foliage. Bark: dark to pale yellow, fairly smooth, with many vertical lines of lenticels and fine fissures exfoliating in irregular wood scales. Blaze: 0.8-1.3 cm, hard, not fibrous, pale orange brown, brittle and granular. Leaves: 30-50 cm long, alternate, paripinnate; common petiole very narrowly bordered, glabrous; leaflets 5-10 pairs, opposite or alternate, 5-18 by 2.5-5 cm, lanceolate, acuminate, entire, glabrous, often slightly falcate or oblique; petioles 2-5 m long. Inflorescence: a compound terminal panicle, 30 cm or more in length, with pubescent branches. Flowers: about 5 mm across, polygamous, greenish white, subsessile, numerous, mostly bisexual. Sepals 5, each with a woolly scale on either side above the claw. Fruit: a globose, fleshy, 1-seeded drupe, sometimes 2 drupels together, about 1.8-2.5 cm across. Seed: 0.8-1.3 cm in diameter, globose, smooth, black, loose in dry fruit [41]

#### ➤ BOTANICAL DESCRIPTION

It is known as tree of North India, a deciduous tree, known to the common man as 'areetha'. It is also known as doda, dodan, and ritha in Indian dialects. It is one of the most important trees of tropical and subtropical region of Asia. It is common tree in Shivaliks and the outer Himalayas of Uttar Pradesh, Uttranchal, Himachal Pradesh, Haryana and Jammu and Kashmir [42]

#### ➤ CLASSIFICATION

- Kingdom: Plantae (plants)
- Subkingdom: Tracheobionta (Vascular plants)
- Superdivision: Spermatophyta (seed plants)
- Division: Magnoliophyta (Flowering plants)
- Class: Magnoliopsida (Dicotyledons)
- Subclass: Rosidae
- Order: Sapindales
- Family: Sapindaceae
- Genus: *Sapindus* L (Soapberry)
- Species: *Sapindus mukorossi* Geartn (Chinese soapberry)

### **1.4. HIBISCUS**

Hibiscus has been used traditionally in various cultures for its medicinal properties, including its ability to help with dandruff. Here is some information on how hibiscus can be used for anti-dandruff purposes, with references to scientific studies: Hibiscus has antimicrobial properties: Dandruff is often caused by a yeast-like fungus called *Malassezia* that lives on the scalp. Hibiscus has been shown to have antimicrobial properties that can help inhibit the growth of this fungus. A study published in the *Journal of Ethnopharmacology* found that hibiscus extracts had significant antifungal activity against *Malassezia*. [43] Hibiscus can help soothe and moisturize the scalp: Dandruff can cause itching and irritation on the scalp, which can make the condition worse. Hibiscus contains mucilage, which is a natural substance that can help soothe and moisturize the scalp. This can help alleviate symptoms of dandruff and prevent further irritation. [44] Hibiscus can help strengthen hair: Weak and damaged hair can be more prone to dandruff. Hibiscus contains vitamins and minerals that can help strengthen hair and improve its overall health. This can help prevent dandruff from occurring in the first place. [45]



#### ➤ CHEMICAL CONSTITUENT

*Hibiscus rosa sinensis* is well studied plant. The report suggested that it contains Tannins, Flavonoids, Steroids, Alkaloids, Saponins, Total phenols, Total flavonoids, Total proanthocyanidin. It has been also reported that it contains majorly Anthocyanins and flavonoids; cyanidin-3,5-diglucoside, cyanidin-3-sophoroside-5-glucoside, quercetin-3,7-diglucoside, quercetin-3- diglucoside. The other compounds are also present like cyclopeptide alkaloid [46], cyanidin chloride, quercetin, hentriacontane [47] and vitamins: riboflavin, ascorbic acid and thiamine. The leaves and stems contain  $\beta$ -sitosterol, stigmaterol, taraxeryl acetate and three cyclopropane compounds and their derivatives. The Hibiscus flowers contain cyanidin diglucoside, flavonoids and vitamins, thiamine, riboflavin, niacin and ascorbic acid. *H. rosa sinensis* extract is a source of many potentially active antioxidants and anticancer constituents such as quercetin, glycosides, riboflavin, niacin, carotene, malvalic acid gentisic acid, margaric acid and lauric acid [48]

#### ➤ MORPHOLOGY

*Hibiscus rosa sinensis* commonly known as red Hibiscus. It is large shrub and has variable structure. It may be upright or broad and spreading. The tree grows up to 4.7 meter tall. All variety of Hibiscus flowers has the stalks of the stamens (the pollan producing part) and the style is fused into along column that is exerted from the centre of the widely spreading petals. The red variety of Hibiscus flowers is very large and can up to 15cm long. The petals may be smooth or scalloped, single or double depends on the cultivated varieties. The anther which is pollan producing part can be seen part way up the column and five round stigma lobes (on to which pollan lands in order for fertilization to occur) are visible at the tip of the column. The leaves of the Hibiscus are ovate in shape (wider at the base than at tip) and grow from 5 to 15 cam long arranged alternatively on the branches. The leaves may be variegated or dark green and the margins are toothed with lighter patches. The fruit of the red Hibiscus is dry, five parted capsule that contains up to three seeds, each of which is kidney shaped and 2.5 cm long. [49]

### ➤ CLASSIFICATION

- Kingdom: Plantae-Plants
- Subkingdom: Tracheobionta-Vascular plants
- Therapeutic Potential of Hibiscus Rosa Sinensis: A Review 107
- Super division: Spermatophyta-Seed
- plants Division: Magnoliophyta-Flowering plants
- Class: Magnoliopsida-Dicotyledons
- Subclass: Dilleniidae
- Order: Malvales
- Family: Malvaceae-Mallow
- family Genus: Hibiscus L.-Rosemallow
- Species: Hibiscus rosa sinensis L.-Shoebblackplant

### 1.5. TULSI

The use of medicinal plants in traditional medicine has been described in literature dating back several 1000 years (Chang et al., 2016). Books on Ayurvedic medicine, written in the Vedic period (3500–1600 B.C.) describe practices, including the use of medicinal plants, that formed the basis of all other medical sciences developed on the Indian subcontinent

*Tulasi*, also known as *Holy Basil*, is a plant of significant cultural and religious importance in Hinduism. It is revered for its medicinal properties and is widely cultivated throughout the Indian subcontinent. Tulasi's introduction can be understood by referencing its botanical attributes, religious significance, and traditional uses.

Botanically, Tulasi is known as *Ocimum tenuiflorum* or *Ocimum sanctum*. It belongs to the *Lamiaceae* family, which includes other aromatic herbs like mint and sage. Tulasi is an erect, bushy plant with dark green or purple leaves that have a distinct aroma. It typically grows up to a height of one to two feet and has small white or purple



flowers. In Hindu culture, Tulasi is considered a sacred plant and is often found in households, temples, and sacred gardens. It holds deep religious significance and is associated with several Hindu deities, particularly Lord Vishnu and his consort, Goddess Lakshmi. According to Hindu mythology, Tulasi is believed to be an incarnation of the goddess and is considered her earthly representative.

In conclusion, Tulasi, or Holy Basil, is a plant of immense cultural, religious, and medicinal significance in Hinduism. Its introduction encompasses its botanical attributes, religious associations, and traditional uses, making it an integral part of the Indian cultural landscape. [50]

### ➤ MORPHOLOGY

Holy basil is an erect, many-branched subshrub, 30–60 cm (12–24 in) tall with hairy stems. Leaves are green or purple; they are simple, petioled, with an ovate blade up to 5 cm (2 in) long, which usually has a slightly toothed margin; they are strongly scented and have a decussate phyllotaxy. The purplish flowers are placed in close whorls on elongated racemes. [4]

The three main morphotypes cultivated in India and Nepal are *Ram tulsi* (the most common type, with broad bright green leaves that are slightly sweet), the less common purplish green-leaved (Krishna or *Shyam tulsi*) and the common wild *vana tulsi* (e.g., *Ocimum gratissimum*). [51]

Leaves have petiole and are ovate, up to 5 cm long, usually somewhat toothed. Flowers are purplish in elongate racemes in close whorls ulsi is native throughout the world tropics and widespread as a cultivated plant and an escaped weed. It is cultivated for religious and medicinal purposes and for its essential oil. [52]

Distribution Grow upto 30 - 60 cm height . Territory Found throughout the Indis . Habit Annual herb. Mool Thin, wired, branches, hairs, soft, colour black to brown from external or dull and violet internal [5]. Tana Stiff, greenly, wooded, branches are hairy, external colour pinkish-brown to black, internal colour dull yellowish, fracture: stringy and slightly aromatic odour. Patra Leaves are 2.5 to 5cm long 1.6 to 3.2 cm wide, elliptically egg shaped, dumb or acute apex, hairy on both sides. Petiole is thin, hairy; odour, aromatic. Chaal Colour: Greyish brown from outside and pale pink from inside, longitudinal cracks are present. Pushpa Purplish or crimson coloured, calyx elliptical or campanulated 3-4 mm bilipped, odour is aromatic, taste is pungent . Phal Four nutlets, each contains one seed, membranous, colour is dull brown or reddish with small black patches, odour is aromatic, taste is pungent. Beej Shape is oval, colour is brown, mucilaginous when soaked in water, odourless, taste is pungent. [53]

### ➤ CLASSIFICATION

Kingdom:	<u>Plantae</u>
Clade:	<u>Tracheophytes</u>
Clade:	<u>Angiosperms</u>
Clade:	<u>Eudicots</u>
Clade:	<u>Asterids</u>
Order:	<u>Lamiales</u>
Family:	<u>Lamiaceae</u>
Genus:	<u>Ocimum</u>
Species:	<i>O. tenuiflorum</i>

### ➤ CHEMICAL CONSTITUENTS OF OS

*Os* leaves are rich in volatile oil (0.7%), phenolics, flavonoids, neolignans, terpenoids and fatty acid derivatives. *Os* seeds contain fixed oil (18–22%), mucilage, polysaccharides and  $\beta$ -sitosterol in the unsaponifiable matter. *Os* seed oil is rich in triglycerides (94–98%) in which linolenic acid (43.8%) is the main content (Naji-Tabasi and Razavi, 2017).

However, other studies have stated tulsi essential oil consists mostly of eugenol (70%)  $\beta$ -elemene (11%),  $\beta$ -caryophyllene (8%), and germacrene (2%), with the balance being made up of various trace compounds,



mostly terpenes.[10] Additionally, some of the phytochemical constituents of *tulsi* are oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, and  $\beta$ -caryophyllene (about 8%). [54]

## **1.6. GINGER**

Indians and Chinese are believed to have produced ginger as a tonic root for over 5000 years to treat many ailments, and this plant is now cultivated throughout the humid tropics, with India being the largest producer. Ginger was used as a flavoring agent long before history was formally recorded. It was an exceedingly important article of trade and was exported from India to the Roman Empire over 2000 years ago, where it was especially



valued for its medicinal properties. Ginger continued to be a highly sought after commodity in Europe even after the fall of the Roman Empire, with Arab merchants controlling the trade in ginger and other spices for centuries. In the thirteenth and fourteenth centuries, the value of a pound of ginger was equivalent to the cost of a sheep. By medieval times, it was being imported in preserved form to be used in sweets. Queen Elizabeth I of England is credited with the invention of the gingerbread man, which became a popular Christmas treat. [55]

Ginger is obtained from the underground stems or rhizomes of *Zingiber officinale*, a herbaceous tropical perennial belonging to the family Zingiberaceae. The chapter begins with a description of the ginger plant and its chemical structure before going on to discuss production, varieties and cultivars. Products of ginger rhizomes – fresh ginger, preserved ginger, dry ginger, ginger powder, ginger oil, ginger oleoresin and ginger paste – are detailed. The main uses and functional properties of ginger, culinary and medicinal (both traditional and modern) are outlined before the chapter finishes with a look at quality specifications, organic ginger and some biotechnology studies. [56]

### **➤ CHEMICAL COMPOSITION**

Ginger contains approximately 50% carbohydrates, 9% protein and free amino acids, 6-8 % fatty acids and triglycerides, 3-6% ash, and 3-6% crude fiber (on dry matter basis) depending on variety, geography, and climatic conditions [57]. Some African ginger varieties contain 5.98 and 3.72g /100 proteins and fat [58]. Soluble and insoluble fibers are also found in ginger. Ginger is a good source of essential micronutrients such as potassium, magnesium, copper, manganese and silicon. Potassium and manganese help to build resistance to disease and protect the lining of heart, blood vessels and urinary passages. Silicon promotes healthy skin, hair, teeth, and nails and helps to assimilate calcium. Small amount of vitamins A, E and some amounts of B- vitamins and Vitamin C are also found in ginger rhizome. [59]

### **➤ MORPHOLOGY**

Morphological studies of Ginger After 2 weeks of cultivation, the average height was reduced with increment time of exposure to gamma ray. In Ginger control group, the highest average height (2.10cm) was detected. In 30 seconds exposure to gamma ray, the average height was 1.04cm. In 60 seconds exposure, the height was decreased (0.82cm) and in 90 seconds exposure, the average height reached to 0.27cm. For the ginger treated with exposure duration of 120 and 150 seconds, the same average height was obtained.

After 5 weeks of planting, all plants produced leaves and roots with at least three veins in a leaf and root. In terms of growth, it was found that plants treated with the 120 and 150 seconds exposure showed very slow growth compared with control plants and those treated with the duration of exposure 30, 60 and 90 seconds. The average plant height was decreased with increasing exposure period (Table 9), while ginger control group showed the highest average height (45.13cm). In 30 seconds exposure period the average height was 42.34cm. Ginger plants treated with the duration of exposure 60, 90 and 120 seconds showed the average height of 22.65cm, 13.75cm and 11.14cm respectively. Ginger plants treated with 150 seconds exposure period showed the lowest average height of 10.08cm (Table 9). At this stage, it appeared that some ginger plants already showed abnormalities in morphology. For the ginger treated with exposure periods of 30 and 60 seconds, abnormalities occurred such as rhizomes had peeled skin. Plants treated with 90 seconds exposure, rhizomes skin was flaky. While ginger plants treated with the 120 and 150 seconds exposure, the rhizomes skin looked peeled, leaves were wrinkled and crinkly and stems were bent. In addition, plants looked like dwarf. [60]

#### ➤ CLASSIFICATION

<b>Kingdom:</b>	<b><u>Plantae</u></b>
<b>Clade:</b>	<b><u>Tracheophytes</u></b>
<b>Clade:</b>	<b><u>Angiosperms</u></b>
<b>Clade:</b>	<b><u>Monocots</u></b>
<b>Clade:</b>	<b><u>Commelinids</u></b>
<b>Order:</b>	<b><u>Zingiberales</u></b>
<b>Family:</b>	<b><u>Zingiberaceae</u></b>
<b>Genus:</b>	<b><u>Zingiber</u></b>
<b>Species:</b>	<b><i>Z. officinale</i></b>

#### ➤ ORIGIN AND DISTRIBUTION [61]

- Ginger represents the long history of its cultivation in India and China and is sup-posed to be originating from Southeast Asia from where it was introduced to other parts of the world (Ravindran and Babu 2005). The exact information about the plant's origin is unavailable due to its long history of cultivation in these regions. The species is found in its cultivated state and is not known in a wild state (Purseglove 1981a). A few other researchers explored it from Eastern Asia, Indo- Malayan region, Africa, America and Northern Australia where it is now distributed widely and used as spice for over 2000 years (Bartley and Jacobs 2000). Gagnepain (1908) described the Indochinese region, Myanmar, Cambodia, Laos and Vietnam among the least known hotspots of the family Zingiberaceae the latest comprehensive study being over a century old.

### **1.7.NEEM**

The Neem tree, is primarily cultivated in the southern regions of Asia and Africa, where it has been seen used through many ages, in medical folklore. We should note that various parts of the Neem tree, including the leaves, bark, fruit, flowers, oil, and gum are associated with the aforementioned medical folklore in the treatment of certain medical conditions such as cancer, hypertension, heart diseases, and diabetes. The potential effects that are seen when using these extracts can certainly be attributed cellular and molecular mechanisms, these mechanisms include free radical scavenging, detoxification, DNA repair, cell cycle alteration, programmed cell death mitigation and autophagy, immune surveillance, anti-inflammatory, anti-angiogenic, and anti-metastatic activities



and the ability to modulate of various' in places like India, Pakistan, and other eastern developing countries, we see practice of complementary alongside allopathic medicine, where several healing traditions stand out such as Ayurveda and Sowa-Rigpa, as these traditions take root in balance and energy or a spiritual healing process. Notably, these traditions embark on the use of several therapies using a complex of herbs and plants, like Turmeric, Amla, Tuls, Guggul and Neem (Rupani and Chavez, 2018, Verma et al., 2019). Interestingly, these mixtures nowadays represent the basis for many commercial products used in cosmetics, soaps, toothpaste, and pest repellents. [62]

#### ***antidandruff properties***

Neem helps to clean the scalp. It clears the clogged pores and improves hair growth. The regenerative properties are extremely essential for the treatment of dandruff [63]. It is endowed with antiseptic and healing properties and it can be used for a variety of hair problems [28]. Dandruff can be removed by using neem leaves as a rinse. The most common neem uses are in our hair care rituals. As per Ayurveda, amla, reetha, neem, shikakai are herbs needed for healthy locks, enhanced hair growth, decrease hair fall and make the hair voluminous [64]

#### **➤ ORIGIN**

The *Azadirachta indica* tree occurs throughout India. According to an estimate, there are about 20 million trees in the country. The neem tree is noted for its drought-resistant property. Usually, it thrives in the regions with sub-arid to sub-humid conditions, with an annual rainfall of about 400 to 1200 mm. It can grow in the area with an annual rainfall of about <400 mm, but in such cases, it depends mainly on the under-groundwater levels. Neem can grow in various types of soil, but it thrives best on well-drained deep and sandy soils (pH 6.2-7.0). It is a typical tropical/subtropical tree and exists at annual mean temperatures at the range of about 21- 32 °C and also it can tolerate high to very high temperatures. It does not tolerate temperature below 4 °C (leaf shedding and death may ensue) [65]

#### **➤ MORPHOLOGY**

Neem, also known as *Azadirachta indica*, is a tree native to the Indian subcontinent. It is widely cultivated in tropical and subtropical regions of the world for its medicinal and insecticidal properties.

The morphology of neem can be described as follows:

**Roots:** Neem has a taproot system, which consists of a large, thick main root that grows deep into the soil, and lateral roots that spread out horizontally. The roots of neem are able to extract nutrients from deep within the soil.

**Trunk:** The trunk of neem is straight, cylindrical, and covered with a gray-brown bark that is rough and fissured. The trunk can reach a diameter of up to 2 meters in mature trees.

**Leaves:** The leaves of neem are compound, with each leaf comprising 20-31 leaflets that are arranged opposite each other along a central axis. The leaflets are oblong or lance-shaped, with a pointed tip and serrated margins. The leaves are dark green in color and have a pinnate venation pattern.

**Flowers:** The flowers of neem are small and white, and are arranged in clusters called panicles. Each panicle can have up to 250 flowers. The flowers have a sweet, fragrant smell and are pollinated by bees and other insects.

**Fruits:** The fruit of neem is a drupe, which is oval or round in shape and about 1-2 cm in diameter. The fruit has a thin, green outer skin and a hard, woody inner shell. Inside the shell are one to three seeds, which are flat, triangular, and covered with a thin, white pulp.

Overall, the morphology of neem is characterized by a large, deep-rooted tree with compound leaves, small white flowers, and oval or round fruit with hard, woody shells [66]

#### ➤ **TAXONOMICAL**

- *Order Rutales*
- *Suborder Rutinae*
- *Family Meliaceae*
- *Subfamily Melioideae*
- *Tribe Melieae*
- *Genus Azadirachta*
- *Species Indica*

#### ➤ **CHEMICAL COMPONENTS**

The main chemical constituents of neem include:

**Nimbin and limbin:** These are triterpenoid compounds found in the neem leaves and seeds. They have anti-inflammatory and antipyretic properties

**Azadirachtin:** This is a limonoid compound found in the neem seeds. It has insecticidal properties and is used as a natural pesticide.

**Salannin:** This is a tetranortriterpenoid compound found in the neem seeds. It has antifeedant and insecticidal properties.

**Nimbidin:** This is a bitter compound found in the neem seeds. It has antipyretic, antifungal, and antibacterial properties.

**Quercetin:** This is a flavonoid compound found in the neem leaves. It has antioxidant and anti-inflammatory properties. **Beta-sitosterol:** This is a phytosterol compound found in the neem leaves and seeds. It has cholesterol-lowering properties and is used as a natural remedy for prostate problems. [67]

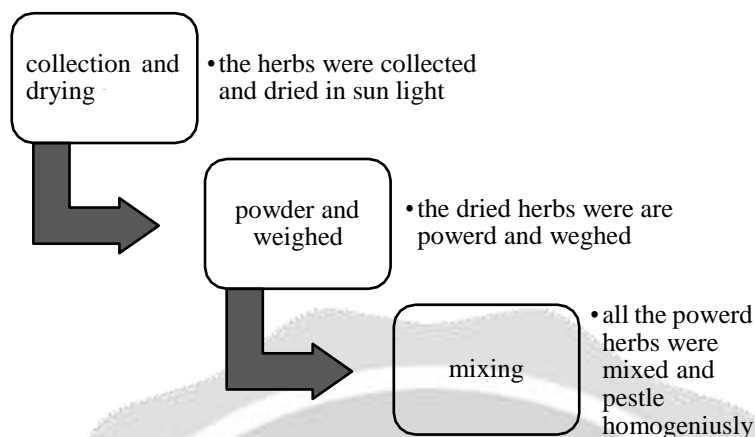
## **2. QUANTITY**

Amla and Hibiscus were taken in the maximum amount, as they have proven hair nourishment property, as on dandruff treatment, the scalp becomes dry, so it is essential to nourish it. Bhringraj, Reetha, Tulsi were taken 25 grams each, as they improve blood circulation and are capable of revitalizing the hair follicles and facilitating hair growth. Reetha and tulsi are anti-bacterial and anti-fungal in nature. Neem and Ginger contain pungent active principles, in concentrated forms, therefore taken in minimal amounts.

Sr.no	Name	Biological Name	Quantity
1	Amla	<i>Phyllanthus Emblica</i>	50gm
2	Bhringraj	<i>Eclipta prostrate</i>	25gm
3	Neem	<i>Azadirachta indica</i>	15gm
4	Reetha	<i>Sapindus mukorossi</i>	25gm
5	Hibiscus	<i>Hibiscus rosa-Sinensis</i>	50gm
6	Tulsi(Holy Basil)	<i>Ocimum sanctum</i>	25gm
7	Ginger	<i>Zingiber Officinale</i>	10gm



## **PROCEDURE**



## **EVALUATION TEST**

There are many evaluation parameters and test are performed to evaluate the quality and ensuring good work as expected by the product . some of the evaluation parameter and their test are enlisted as followed

### **1. ORGANOLEPTIC PROPERTIES**

Organoleptic properties refer to the sensory characteristics. Substance, including its appearance, color, and odor taste and texture was carried out. Color and texture carried out by sensation by touch and vision.

### **2. pH**

pH affect the pharmaceutical consideration as well as it affect the effect of shampoo on hairs. 1gmof powder shampoo was taken and 9ml of distilled water was added to it. pH of the resulting solution was calculated using pH meter at 370°c

### **3. SOLUBILITY**

Solubility is defined as the ability of the substance to soluble in a solvent. One gram of the powder is weighed accurately and transferred into a beaker containing 100 ml of water. This was shaken well and warmed to increase the solubility. Then cooled and filter it, the residue obtained is weighed and note

### **4. WASHABILITY**

Formulations were applied on the skin and then ease and extent of washing with water were checked manually.

### **5. SKIN IRRITATION TEST:**

The skin irritation tests revealed that the herbal shampoo powder shows no harmful effect on skin. This is due to the absence of synthetic surfactants. Most of the synthetic surfactants produce inflammation of the

eyelid and corneal irritation. But in this formulation of herbal shampoo powder, the uses of all ingredients are obtained naturally. So it does not produce any harmful effect on skin

#### 6. FOAMING ABILITY AND FOAM STABILITY:

Cylinder shake method with slight modification was used for determining foaming ability. 50ml of the 1% shampoo solution was put into a 100 ml measuring cylinder and covered with hand. Measuring cylinder was shaken for 1 minute. The total volume of the foam contents after 1 minute shaking was recorded. The procedure was continued for 5 minutes.

#### 7. CLINING ABILITY

About 1 g of grease is spread on non-adsorbent cotton and kept in conical flask containing 1% shampoo solution. The conical flask is shaken for 1 hr in mechanical shaker. Cotton is collected, dried and weighed. The amount of grease removed

#### 8. ANGLE OF REPOSE

Funnel method: Required quantity of powder is allowed to flow through a funnel which is placed at a height of 6 cm from horizontal base. The powder is allowed to flow to form a heap over the paper on the horizontal plane. The radius and the height of the powder heap is noted down.

#### 9. BULK DENSITY

(Untapped) Moisture content Moisture content in the formulation is very important as it contains herbs which are liable to be attacked by weather. 2gm of powder was taken and kept in an oven and dried up to two constant reading and % moisture content was calculated as w/w.

#### 10. TAPPED DENSITY

The tapped density is an increased bulk density attained after mechanical tapping a container containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped for 1 min and volume or mass reading are taken until little further volume or mass change was observed. It was expressed in gram per cubic centimeter [68]

### 4. CONCLUSION AND RESULT

The herbal powderd shampoo were prepared by the mixing of various herbs that have many special uses for hairs as anti-dandruff, nurrishing properties, etc. this herbs were mostly used in day to day life these are amla, beingraj, ritha, hibiscus, tulsı, ginger, neem are the basic parts of the composition . in the study all the above herbs were studied for their properties with due respect of their morphology, classification, chemical constituents, geographical and botanical distribution are studied, and all this herbs were showed their nessesory promising properties toward the formulation.

For the formulation the amount of all component were weight according to their specific properties and then they procced to formulate powder shampoo. The herb were dried properly and powderd by pestel and mix homoginiously after drying all the herbs in sun light. After the formulation evaluation test were performed in this test many phisico-chemical properties were evaluated like organoleptic properties, pH, bulk & tapped density. The result as shown above are obtained as refrance range and have showed all the expected result with resp. to refrance.

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