



## **PREPARATION AND EVALUATION OF POLYHERBAL HAIR OIL :An Effective Cosmetic**

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### **ABSTRACT:**

The concept of beauty and cosmetics has been intertwined with human civilization since ancient times. Cosmetics hold significant importance in our daily lives, and herbal cosmetics stand out as a particularly effective area within cosmetic technology. They are formulated by combining bioactive ingredients with pharmaceutical products, utilizing herbs for body beautification, cosmetic preparation, flavouring, and colouring. Hair, being a crucial aspect of human personality, often requires various cosmetic products for care. Many beauty and cosmetic products incorporate herbs to impart a youthful and attractive appearance. Herbal hair formulations contain diverse herbal ingredients that provide essential nutrients like vitamins and antioxidants. Herbal hair oils have long been utilized for nourishing and protecting hair from damage and hair fall. Today, the prevalence of side effects from beauty products underscores the preference for herbal alternatives, which are perceived to have a lower likelihood of adverse reactions.

**Keywords:** Herbal cosmetics, Bioactive ingredients, Pharmaceutical products, Body beautification, Cosmetic preparation, Hair care, Herbal oils, Hair fall, Nutrients, Nourishing, Hair damage, Herbal alternatives.

### **1 Introduction:**

Hair possesses several beneficial attributes in the animal kingdom. It serves as a protective cushion around the head and other sensitive parts of the body. Hair oils are crafted to impart a healthy shine and gloss to the hair by applying a thin, continuous film of oily substance to the hair surface, without causing stickiness. Various herbs such as Amla, Almond, and Hibiscus are commonly incorporated into hair oils. Hair oils have gained popularity due to their ability to promote hair growth, enhance the beauty of hair, and prevent hair fall.

Hair oils are categorized as hair care products, defined as formulations used for cleansing, improving hair texture, nourishing the hair, and maintaining its healthy appearance. They are applied to address hair disorders such as baldness, greying, hair fall, and dryness, while also providing nourishment. Natural cosmetics, including herbal hair oil, are in high demand due to increasing interest and their effectiveness with minimal side effects, utilizing readily available ingredients. Natural hair oils play a crucial role in natural cosmetics, offering essential moisture to the scalp and promoting beautiful hair growth.

Herbal hair oils, often referred to as hair tonics, contain vital nutrients essential for maintaining the normal function of sebaceous glands and promoting natural hair growth. They are widely recognized for their effectiveness in hair treatment. The use of hair oils is on the rise, reflecting advancements in people's living standards. To infuse natural flavors and colors into hair oils, herbal essences and perfumes are incorporated. In recent years, herbal hair care has gained prominence, surpassing synthetic alternatives in popularity. The utilization of hair oils has seen a surge due to their efficacy in addressing various hair issues. Hair oils are formulated with both synthetic and natural ingredients. Synthetic hair oils, comprising chemical or artificial substances, are employed to provide shine, exceptional conditioning, and reduce frizz.

### **List of types of herbal hair oils:**

#### **1. Hair Growth Oil:**

- Stimulates hair follicles.
- Promotes blood circulation in the scalp.
- Encourages healthy hair growth.

#### **2. Hair Strengthening Oil:**

- Strengthens hair strands.
- Reduces breakage.
- Prevents split ends.

#### **3. Anti-Dandruff Oil:**



- Combats dandruff.
- Soothes an itchy scalp.
- Treats scalp infections.

#### 4. Hair Conditioning Oil:

- Nourishes and moisturizes hair deeply.
- Leaves hair soft, smooth, and manageable

#### 5. Scalp Treatment Oil:

- Treats scalp conditions like dryness and inflammation.
- Soothes scalp irritation.
- Helps maintain scalp health.

#### 6. Hair Thickening Oil:

- Adds volume and thickness to thin or fine hair.
- Improves hair density.

#### 7. Preventive Hair Care Oil:

- Maintains overall hair health.
- Protects hair from damage.

## 2 LITERATURE REVIEW

### **jagtap N.N(2018)**

The formulation of herbal hair oil using hibiscus flowers is deeply rooted in the ancient tradition of herbal cosmetics, which dates back to the earliest human civilizations. Hibiscus, revered for its beauty-enhancing properties, has been a staple ingredient in various cultural practices aimed at promoting hair health and vitality.

Drawing upon the concept of bioactive ingredients, herbal hair oil formulations harness the therapeutic potential of hibiscus flowers. Rich in vitamins, antioxidants, and amino acids, hibiscus offers a natural solution to common hair concerns such as baldness, hair fall, dryness, and dandruff. Its nutrient-rich profile nourishes the scalp, strengthens hair follicles, and stimulates hair growth, making it a valuable component in herbal hair care products.

### **Swati P. Deshmukh (2023)**

Review article emphasizes the importance of herbal hair oil for the healthy life of hairs. Herbal hair oil is hair care components implemented to the hair for the treatment of hair disorders. Herbal hair oil is a critical part of natural cosmetics. This review article involves the objectives of herbal hair oil, which includes herbal goodness of hair, manage frizzy hair, fight towards hair fall, etc. This emphasizes on the commonly used ingredients in the formulation of herbal hair oil which involves coconut oil, till oil, almond oil, Hibiscus, jasmine. This review also involves a table in which there is mentioned the ingredients, the quantity used in the formulation and the importance of the ingredients mentioned

### **Vaibhav P. Gote(2017)**

The paragraph emphasizes the significance of herbal hair oil in maintaining hair health and addressing various hair concerns. It outlines the objectives of herbal hair oil, including enhancing hair goodness, managing frizz, and combating hair fall. Hibiscus is highlighted as a commonly used ingredient alongside other oils and botanicals. A table detailing ingredients and their importance underscores hibiscus's role. The benefits of herbal hair oil, including promoting healthy hair growth, are discussed, and rigorous methods and evaluation tests ensure product efficacy. As consumer preference for natural hair care grows, herbal hair oil, enriched with hibiscus, continues to gain popularity as a preferred choice for holistic hair care

### **Neha bansod (2021)**

The paragraph outlines the objectives of herbal hair oil, which include enhancing the herbal goodness of hair, managing frizz, and combating hair fall. Hibiscus, with its nourishing and strengthening properties, aligns well with these objectives, making it a valuable ingredient in herbal hair oil formulations. Hibiscus is mentioned among the commonly used ingredients in herbal hair oil formulations, alongside coconut oil, sesame oil, almond oil, and jasmine. This highlights the importance of hibiscus as a key component in herbal hair care, contributing to the overall effectiveness of the oil in promoting hair health

### **Gaurav suamn (2020)**

The paragraph provides a historical perspective on the importance of cosmetics in human life, highlighting the ancient roots of beauty practices and the evolving role of herbal cosmetics in modern times. It emphasizes the use of herbs in cosmetic formulations for beautification, flavouring, and colouring purposes, underscoring their natural and holistic approach to skincare. Furthermore, it addresses the significance of hair care in human personality and the prevalent use of cosmetics to address common hair problems like baldness, hair fall, and dandruff. This context is relevant to understanding the importance of herbal hair oil, which is widely utilized for nourishing and protecting hair from damage and hair fall. Moreover, the paragraph touches on the contemporary concern of side effects associated with beauty products, highlighting the preference for herbal alternatives due to their perceived lower risk of adverse reactions. Overall, the paragraph sets the stage for discussing the importance and benefits of herbal hair oil in addressing various hair concerns while minimizing the potential for side effect.

### **Sayantana Mukopadaya (2017)**

The paragraph provides a broad overview of the historical significance of cosmetics and the increasing preference for herbal products in modern beauty practices. It underscores the role of herbs not only in traditional beauty rituals but also in contemporary cosmetic formulations, where they are valued for their natural properties and effectiveness. The mention of hair's vital role in human personality highlights the importance of hair care, prompting the discussion on herbal hair oil and its widespread usage for hair nourishment and protection. Additionally, the paragraph acknowledges the growing concern over side effects associated with conventional beauty products, leading to a shift towards herbal alternatives perceived to offer safer solutions. This

recognition of herbal cosmetics' appeal and efficacy in addressing various hair issues provides a context for further exploration of the benefits and applications of herbal hair oil in promoting hair health and vitality

#### Padma Thiagarajan et.al (2015)

The paragraph introduces a project focused on harnessing the potential of hibiscus flowers in creating herbal oil for hair care. It highlights the enduring significance of beauty practices throughout human history and the contemporary trend towards natural cosmetics, positioning the project as a response to this demand. By specifically utilizing hibiscus flowers as a key ingredient, the project capitalizes on the plant's reputed benefits for hair health. The paragraph could further elaborate on the unique properties of hibiscus flowers that make them suitable for hair care, such as their rich content of vitamins, minerals, and antioxidants known to nourish the scalp and promote hair growth. Additionally, it could discuss the formulation process, emphasizing how hibiscus extracts are incorporated into the herbal oil to maximize their efficacy

### Ingredients used in herbal hair oil with their uses.

Sr. No.	Ingrdients	Uses
1	Coconut oil	Moisturizes the scalp and hair, prevents protein loss from hair, promotes hair growth, and adds shine.
2	Amla	Strengthens hair follicles, promotes hair growth, prevents hair breakage, and adds shine to hair.
3	Brahmi	Improves blood circulation in the scalp, strengthens hair roots, prevents hair loss, and promotes hair thickness.
4	Bhringraj	Stimulates hair growth, prevents hair fall, treats scalp conditions like dandruff and itchiness, and prevents premature graying.
5	Neem	Treats scalp infections, prevents dandruff, reduces scalp inflammation, and promotes a healthy scalp.
6	Hibiscus	Strengthens hair, prevents split ends, promotes hair growth, conditions hair, and adds volume and shine.
7	Rosemary	Stimulates hair follicles, improves circulation to the scalp, treats dandruff and dry scalp, and promotes hair growth.
8	Fenugreek	Strengthens hair roots, prevents hair loss, treats dandruff, conditions hair, and adds shine.
9	Lavender	Calms and soothes the scalp, reduces scalp inflammation, treats dandruff and itchiness, and promotes hair growth.
10	Peppermint	Stimulates hair follicles, improves blood circulation to the scalp, reduces scalp inflammation, and promotes hair growth.

### 3 Material and method

Pharmacognostic study:

Macroscopy [9]:

The leave's macroscopic features, including color, odour, size, shape, texture, and taste, were assessed through visual observation.

Microscopy

Microscopic analysis of hibiscus leaves entails the examination of its cellular structure, composition, and morphology at a microscopic level. hibiscus leves is sourced from the leaves of the main species being *Rosa siniesies* Analyzing hibiscus leaves under a microscope allows for the exploration of its cellular structure and morphology to comprehend its botanical attributes

Physico-chemical standards [10, 11, 12, 13]:

The physico-chemical evaluation involved utilizing powdered plant drug materials. This assessment encompassed examining organoleptic characteristics, loss on drying, ash value, and extractive value.

#### A] Loss on drying:

The determination of loss on drying (% LOD) was conducted utilizing the gravimetric technique:

- About 1.5 grams of the crude drug were carefully weighed into a pre-weighed porcelain dish.
- The sample underwent drying in an oven set at 100°C until two successive weighing's displayed a discrepancy of no greater than 0.5 mg.
- Following cooling within a desiccator, the final weight was recorded, typically indicating the extent of moisture loss.

Weight of sample - weight of dried sample

% of loss on drying =  $\frac{\text{Weight of sample} - \text{Weight of dried sample}}{\text{Weight of sample}} \times 100$

Weight of sample

**B] Determination of Ash values:**

The ash value is an essential parameter for assessing the quality and purity of a drug. It comprises inorganic components such as phosphates, carbonates, and silicates of sodium, potassium, magnesium, calcium, and other elements. At times, the occurrence of inorganic contaminants like calcium oxalate, silica, and carbonate in the crude drug can affect the overall ash value. In such instances, these impurities are removed through acid treatment, after which the acid-insoluble ash value is determined.

**i] Determination of total ash:**

- Accurately measure around 2 grams of the powdered drug and transfer it into a porcelain dish previously weighed. Then, subject it to incineration utilizing a Bunsen burner.
- Heat the mixture until vapors are nearly absent, then elevate the temperature until complete combustion of carbon occurs.
- Let the dish cool within a desiccator. The percentage of ash was calculated using a designated formula.

(Weight of ash)

Percentage of total ash= \_\_\_\_\_ X 100

Weight of drug take

**4 EXTRATING****Cold pressing:**

The cold pressing method is a simple and gentle technique used to extract juice or essential oils from plant materials, including curry leaves:

- 1. Prepare the Curry Leaves:** Start with fresh hibiscus leaves. Rinse them thoroughly under running water to remove any dirt or debris. Pat them dry with a clean cloth or paper towel.
- 2. Crushing the Leaves:** Crush the hibiscus leaves using a mortar and pestle, a blender, or a food processor. The goal is to break down the leaves and release their natural juices. Avoid over-crushing, as this could introduce excess plant material into the extract.
- 3. Containment:** Place the crushed hibiscus leaves in a clean cloth, muslin bag, or cheesecloth. The cloth will act as a filter to separate the solid plant material from the liquid extract.
- 4. Squeezing:** Squeeze the cloth containing the crushed leaves to extract the juice. Apply gentle pressure to maximize the extraction without damaging the cloth. This process may take some time, and you may need to twist and wring the cloth to ensure thorough extraction.
- 5. Filtering:** Once you've squeezed out as much juice as possible, filter the extracted liquid to remove any remaining solid particles. You can use a fine mesh strainer or a coffee filter for this purpose. Filtering helps improve the clarity and purity of the extract.
- 6. Storage:** Transfer the filtered curry leaves extract to a clean, airtight container. Store it in the refrigerator to prolong its freshness and shelf life. It's best to use the extract within a few days to ensure maximum potency.

**Preparation of herbal hair oil (50ml):**

SR.NO	INGREDIANT	F1	F2	F3
1	Hibiscus flower	6gm	12gm	16gm
2	Curry leaves	6gm	12gm	16gm
3	Onion	6gm	12gm	16gm
4	Amla powder	6gm	12gm	16gm
5	Fenugreek seed	6gm	12gm	16gm
6	Shikaki	6gm	12gm	16gm
7	Coconut oil	50ml	50ml	50ml

## 5 Process of the formulation

All the dried and fresh herbs such as hibiscus, amla, aloe vera , fenugreek seed , curry leaves , & coconut oil etc, were weighed and grinded in the mixture and mixed in 25% of coconut oil.



The above content was boiled for 15 min and was filtered through muslin cloth.



To the filtrate 25% coconut oil was added to make up the volume (50ml.)



Finally, small amount of flavouring agent was added to the oil and it was placed in amber coloured bottle

## 6 Evaluation of herbal hair oil

The formulated herbal hair oil was levied to physical and biological evaluation

### ❖ Organoleptic Evaluation-

organoleptic property-Colour, odour, skin irritation was determined manually. Oil was applied on hand and exposed to sunlight for 5mins to check for any irritation over skin

### ❖ . SPECIFIC GRAVITY

Take the specific gravity bottle, rinse it with distilled water, dry it in the oven for 15 minutes, cool, close it with a cap and weigh it (a). Now fill the same specific gravity bottle with the herbal hair oil and close it with a cap and again weigh it (b). Determine the weight of the sample per milliliter by subtracting the weight (b-a).

### ❖ Sensitivity test:

The prepared herbal hair oil was applied on 1 cm skin of hand and exposed to sunlight for 4-5 min.

### ❖ Acid value:

10ml of oil was added with 25 ml of ethanol and 25 ml of ether. Phenolphthalein was added as indicator and titrated with 0.1M potassium hydroxide solution, Acid value =  $5.61n/w$

Where, n= Number of ml of 0.1M KOH w= Weight of oil

### ❖ Saponification value:

2g of oil was accurately weighed and transferred into a 250ml iodine flask. 25 ml of 0.5M alcoholic potassium hydroxide was added and boiled under reflux on a water bath for 30 mins. Phenolphthalein was added as indicator and titrated against 0.5M HCl ('a' ml). Similarly blank was performed ('b' ml) without the sample. Saponification Value:  $28.05(b-a)/w$  Where, w= weight in grams of the solution.

### ❖ PH :

The pH of polyherbal hair oil was determined by using a pH meter. The most accurate common means of measuring pH is through a lab device called probe and meter, or simply, a pH metre. The probe consist of a glass electrode through which a small voltage is passed. The meter, a voltmeter, measures the electronic impedance in the glass electrode and displays pH units instead of volts. A pH meter typically has to be calibrated before each use with two standard liquid solution of known pH. Measurement is made by submerging the probe in the hair oil until a reading is registered in the pH meter

### ❖ VISCOSITY:

It is an index of resistance of a liquid to flow, the higher the viscosity of a liquid, the greater is the resistance to flow. The viscosity was determined by using Ostwald's viscometer.

## 7 Conclusion :

### organoleptic characrestics of polyherbal hair oil

Parameter	F1	F2	F3
Colour	Greenish brown	Greenish brown	Greenish brown
odour	Pleasant	Pleasant	Pleasant

<b>Physical state</b>	Liquid with greasy in nature	Liquid with greasy in nature	Liquid with greasy in nature
<b>Solubility</b>	non polar solvent	Non polar solvent	Non polar solvent
<b>Specific gravity</b>	0.98	0.88	0.84
<b>Ph</b>	5.95	5.78	5.53
<b>Viscosity</b>	0.0505	0.0525	0.0549
<b>Acid value</b>	9.452	14.325	16.876

### Pharmacological study:

The Hibiscus flower, particularly *Hibiscus sabdariffa*, exhibits numerous pharmacological properties that make it valuable in both traditional and modern medicine. Rich in antioxidants like anthocyanins and flavonoids, it combats oxidative stress and reduces the risk of chronic diseases. Its antihypertensive and cardio protective effects help lower blood pressure and improve heart health. Hibiscus also demonstrates antimicrobial activity against various pathogens, aiding in infection control and wound healing. Additionally, it regulates blood sugar levels, supporting diabetes management, and reduces lipid levels, which benefits those with hyperlipidaemia.

. Its anti-inflammatory properties alleviate inflammation and pain, while its hepatoprotective effects safeguard the liver. Furthermore, Hibiscus aids in weight management by inhibiting carbohydrate and lipid absorption and shows potential anticancer properties through its ability to induce apoptosis in cancer cells. These diverse benefits highlight the medicinal value of the Hibiscus flower. The Hibiscus flower, renowned for its vibrant beauty, also possesses a plethora of pharmacological benefits that underscore its significance in medicinal practices. Laden with antioxidants such as anthocyanin and flavonoids, Hibiscus effectively scavenges

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