



# FORMULATION AND EVALUATION OF SESBANIA GRANDIFLORA HAIR OIL FOR HEALTHY HAIR GROWTH

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**Abstract :** Herbs & herbal drugs are clinically proved good for hair growth. Hair loss problem is one of great concern to both males & females. Hair plays a vital role in the personality of human and for their cure we use lots of cosmetic products. The present study used to formulate and evaluate Polyherbal hair oil using various efficient herbs. The main ingredient which we have used in our hair oil is *sesbania grandiflora* seeds. And the seeds extract of *sesbania grandiflora* is rich in biotin which is very beneficial for our hair. And other efficient herbs we have used like Hibiscus rosa sinensis (Flowers), Trigonella foenum-graecum (seeds), nigella or kalonji (seeds), Murraya koenigii (leaves), Coconut oil (base oil), Lavender oil, Jojoba (oil), Almond oil in the form of poly herbal oil using boiling method. This ingredients are rich in various vitamins, proteins, antioxidants and so many other constituents which are important for the growth. Herbal formulations always have attracted considerable attention because of their good activity and comparatively lesser or nil side effects with synthetic drugs. Herbal hair oil not only moisturizes scalp but also converse dry scalp and dry hair conditions. Ayurvedic system is the traditional system of medicine having major treatment across globe various synthetic medicines are available for hair loss which does not treat permanently & also shows severe side effects.

Herbal formulations always have attracted considerable attention because of their good activity and comparatively lesser or nil side effects with synthetic drugs. Herbal hair oil not only moisturizes scalp but also converse dry scalp and dry hair conditions. Ayurvedic system is the traditional system of medicine having major treatment across globe various synthetic medicines are available for hair loss which does not treat permanently & also shows severe side effects.

**Index Terms** - Hair oil, *Sesbania Grandiflora*

## Introduction

### INTRODUCTION

Hair is a protein filament that grows from follicles found in the dermis. Hair is one of the defining characteristics of mammals. Most common interest in hair is focused on hair growth, hair types and hair care, but hair is also an important biomaterial primarily composed of protein, notably alpha keratin. The prominent problems arise with in cosmetics are Dandruff, hair loss, dry hair, spit ends, frizzy hair, dull hair, heat damaged hair, color damaged hair, grey hair, etc. To overcome these problems there are many cosmetics available in markets, such as hair oils, hair shampoos, hair conditioners, hair serums, hairs gels, hair mask, hair dyes[1].

Hair is one of the imperative parts of the body derived from ectoderm of the skin, it is ornament structure along with sebaceous gland. Hair is a dead part with no nerve connections. The hair follicle has the unique ability to regenerate itself. The basic part of hair is bulb (a swelling at the base which originates from the dermis), root (which is the hair lying beneath the skin surface), shaft (which is the hair above the skin surface). The growth of hair is cyclic phase divided into following- anagen (growth), catagen (involution) and telogen (rest). Pigmentation

problems (Fading), dandruff and falling of hair (Shedding) are associated problems with hair. The loss of hair is not life threatening, but has profound impact on social interactions. There are no concord views on hair loss, it is quite controversial issue[3]

Hair oils are the hair care preparations used for the prevention and treatment of baldness or other ailments aggression of hair. They also promote the luxurious growth of hairs. Hair oil containing herbal drugs are used as hair tonic. Hair care products are categorized into two main category, hairtonics and hair grooming aids. These are basically the extracts of medicinal plants in an oil base.[2]A few of these herbs are Agathi keerai, Meethi, Onion, Hibiscus flower, Curry leaves, Camphor

### Botanical description

#### (1) *Sesbania grandiflora* (Seeds)



Common name :- Agathi ,Vegetable hummingbird.

Family: -Fabaceae

Plant part used:-Seeds

Medicinal properties: -Antidandruff, Antioxidant and Antimicrobial.

Medical use:- The seeds of *sesbania grandiflora* improves blood circulation in the scalp for healthy follicles. use to treat various types of ailments such as Bacterial infection, fever and inflammation.

The Seeds of *Sesbania Grandiflora* improves blood circulation in the scalp for healthy follicles. healthy hair growth and stronger hair: Biotin derived from herb *Sesbania* Extract seeds to help control hair fall and hair thinning. Helps to provide plant derived Biotin-Hair Growth, Hair Strength, Hair Thickness, and Healthy Scalp.

Chemical constituent:- Three isoflavonoids, isovestitol (1), medicarpin (2), and sativan (3), along with another known compound, betulinic acid (4), were isolated from the seeds of *Sesbania grandiflora*.

#### (2) *Murraya koenigii*



Common Name- Karipatta, Curry leaves, Daunkari

Family-Rutaceae

Plant part used- Leaves

The species name commemorates the botanist Johann König. The genus Murray commemorates Swedish physician and botanist Johann Andreas Murray who died in 1791. Hence the botanical name of the curry leaves is *Murraya Koenigii*.

Medicinal properties: Antioxidant

Medicinal use: promote hair growth and premature graying of hair.

### (3) *Nigella sativa*



Common Name: Onion seeds, Kalonji, Black caraway

Family: Ranunculaceae

Medicinal properties: Antioxidant, Antifungal, and Anti bacterial.

### (4) *Hibiscus rosa-sinensis*



Common Name: Chinese Hibiscus, China Rose, Orhul

Family: Malvaceae

Plant part used: Flower

Medicinal properties: Anti-inflammatory, Antioxidant and Anti-bacterial

Medicinal use: Hibiscus is a rich source of hydroxy acids that can make your skin healthy and beautiful. Here are some amazing hibiscus benefits for skin and hair, hibiscus is widely accepted in India for hair growth and is often used in herbal hair oils. Herbal hair oils are typically a combination of herbal extracts, such as hibiscus, mixed with a carrier oil base, such as almond oil, coconut oil etc

**(5) Trigonella Foenum Gracecum**



Common Name: Fenugreek seeds, Methi

Family: Fabaceae

Plant part used: Seeds

Medicinal properties: Antimicrobial, Antifungal

Medicinal use: It fights dandruff, controls scalp inflammation, prevents hair loss and its main extensive use in hair regrowth.

**(6) Cinnamomum camphora (L.)**



Common Name: Kapur

Family: Laurels

Medicinal properties: Antibacterial, Antifungal, Anti-inflammatory

Medicinal use: Use as anti-dandruff. Camphor may also be useful in treating scalp ringworm. It reduces inflammation and keeps your scalp moisturized and healthy.

**OILS**



Lavender Oil:-

Lavender oil is an essential oil obtained by distillation from the flower spikes of certain species of lavender. Lavender oil has long been used as a perfume, for aromatherapy, and for skin applications. The lavender essential oil is extracted from the flowers of the lavender plant (*Lavandula angustifolia*), primarily through steam distillation. Lavender perfume and body sprays are popular due to their fresh and floral scent. On the other hand, the pure lavender essential oil is frequently used in various forms including as an aromatherapy oil, in candles,

infusions, lotions, soaps, baby products and candles. The lavender essential oil is useful for hair care. It has been shown to be very effective on lice, lice egg and nits. The lavender essential oil is also useful in the treatment of hair loss.

Cocos nucifera oil:-



Cocos nucifera oil is also known as coconut oil, copra oil belongs to family Aceraceae. It is used to moisturize the hair, avoid breakage of hair, blood flow and blood circulation, antibacterial agent

Coconut oil stops the hair from absorbing water especially in humid climates, which can help prevent frizz. As coconut oil can penetrate the hair shaft, it can also help smoothen damaged, uneven hair.

Almond oil



Softens the hair, for Hair growth, Straightening and Repairing. Treating scalp conditions. Treating Hair loss and Split ends.

Rich in Vitamin E. It contains Vitamin B7 or Biotin.

4) Jojoba oil



Jojoba oil has an oily composition, so it can be used as a Moisturizer. It can also be added to hair conditioners to give you protection against dryness, breakage and split-ends. The oil can also moisturize the scalp and may be a dandruff remedy.

## Materials and methods

### 3.1 Collection of Plant Materials:-

*Sesbania grandiflora* seeds, Fenugreek seeds, Onion seeds, Camphor and coconut oil were purchased from local market of Gondia District. Lavender oil, Jojoba oil and Almond oil were available in laboratory. Hibiscus flower, *Murraya Koenigii* were collected from local area of Gondia District. Herbarium sheet of plant specimen is certified by Department of Botany, D.B Science Gondia.

### 3.2 Instruments Used: -

Soxhlet apparatus, Autoclave, Electronic Blender.

### 3.3 Chemical Used :- DPPH Solution for antioxidant property

### 3.4 Macroscopy and physiochemical analysis of *sesbania grandiflora* seeds.

Macroscopy:-

- 1 .Size and Shape :- *Sesbania grandiflora* seeds are medium to large in size, measuring about 2- 3 centimeters in length. They have an elongated shape, resembling a small bean or pea, and are slightly curved. [5]
- 2 . Color :- The seeds typically have a dark brown or black color. The outer seed coat is smooth and glossy.[3]

#### **Physiochemical Analysis:-**

1. Moisture Content: Determining the moisture content sample of seeds to a constant weight and calculating the percentage of moisture lost.[6]
2. Ash Content: Ash content indicates the total mineral content present in the seeds. It is determined by incinerating a known weight of seeds and measuring the remaining ash.[7]
3. Protein Content: The protein content of *Sesbania grandiflora* seeds can be estimated using methods like the Kjeldahl method or the Dumas method. These methods involve digesting the seeds with concentrated sulfuric acid and then determining the nitrogen content, which is used to calculate the protein content.[3]
4. Fiber Content: The fiber content of the seeds can be determined by separating the insoluble dietary fibers from the rest of the seed components. Various techniques, such as acid/base hydrolysis, can be used to quantify the fiber content.[8]
5. Carbohydrate Content: Carbohydrates can be estimated by difference after subtracting the sum of protein, lipid, ash, and fiber contents from the total weight of the seeds. [6]
6. Phytochemical Analysis: *Sesbania grandiflora* seeds may contain various phytochemicals, such as flavonoids, tannins, alkaloids, saponins, and phenolic compounds. These compounds can be identified and quantified using appropriate extraction and analytical methods, such as chromatography and spectroscopy.[6]

Sr. No.	Ingredients	Quantity
1	<i>Sesbania Grandiflora seeds</i>	10g
2	<i>Murraya Koenigii</i>	5g
3	<i>Nigella Sativa</i>	5g
4	<i>Hibiscus Rosa- Sinensis</i>	10g
5	<i>Trigonella Foenum-graecum</i>	5gm
6	<i>Cinnamomum Camphora (L.)</i>	1g
7	<i>Lavender Oil</i>	30ml
8	<i>Cocos Nucifera oil</i>	100 ml
9	<i>Almond oil and jojoba oil</i>	100ml/50ml

#### 4)Preparation of Herbal Extract: -

The seeds of sesbania grandiflora were dried in shade under normal environmental condition and homogenized to coarse powder and stored in jar until use. Powdered drug was charged into Soxhlet apparatus with methanol solvent. Methanolic extract was evaporated by heating until dried residue and concentrated methanolic extract was collected.

#### FORMULA:-

#### PROCEDURE: -

Herbal hair oil was prepared by boiling all the prescribed herb according to the formula. This process ensures adsorption of the active therapeutic properties of the ingredients used.[1]

#### Methods of preparation: -

- 1) Herbs are weight by using weighing balance whereas, oils are measured through pipette.
- 2) The oils and herbs are mixed together in a vessel.
- 3) The above mixture is then allowed to boil on low flame with continuous stirring for 30minutes. So, as to avoid the adherence of the medicinal plants to the bottom of the vessel.
- 4) At this step moisture of the medicinal plant commenced to evaporate so it is agitated frequently and carefully to ensure that the mixture does not stick at the bottom of vessel.
- 5) The herbs are taken out from time to time to know the condition and stage of mixture of oils.
- 6) As further heating to the content, the oil starts to form a froth. This is the condition where all the active ingredients of medicinal plants start to concentrate in oil.
- 7) In the next step, the mixture is filtered through muslin cloth.
- 8) The collected strain is final herbal hair oil product.[1]

#### EVALUATION OF HERBAL HAIR OIL PHYSIOCHEMICAL PARAMETERS OF HERBAL OIL

preliminary evaluation of formulations at different concentrations was carried out as follows : -

##### • Sensitivity test:

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

- **Acid value:Preparation of 0.1 molar solution:** Weighed 0.56 g KOH pellets and dissolved in 100 mL of distilled water and stirred continuously. The prepared 0.1 molar KOH solution was filled in the burette.[4]

##### ➤ Preparation of sample:

10 mL oil was measured and dissolved in 50 mL of 1:1 ethanol and ether mixture and shaken vigorously. 1 mL of phenolphthalein solution was then added and titrated with 0.1 molar KOH solution. [4]

##### • Saponification value:

To accurately weighed 1 mL of oil in a 250 mL of conical flask, 10 mL of ethanol: ether mixture (2:1) was added. To this, 25 mL of 0.5 N alcoholic KOH was added and was kept undisturbed for 30min. and the flask was cooled. This solution was titrated against 0.5 N using phenolphthalein indicator. Similarly, the blank titration was performed without taking oil (sample). Amount of KOH in mg used was calculated using phenolphthalein indicator. Similarly, the blank titration was performed without taking oil (sample). Amount of KOH in mg used was calculated using formula, Saponification Value =  $56.1(B-S) N/W$

Where,

B= Volume in mL of standard Hydrochloric acid required for the blank. S= Volume in mL of standard Hydrochloric acid required for the sample. N= Normality of standard Hydrochloric acid.

W= Weight of the oil taken in gms for the test.[3]

- **PH:** The pH of herbal hair oil was determined using pH meter.[3]
- **Viscosity:** The viscosity was determined using Ostwald's viscometer.[4]

#### Evaluation of Anti-oxidant activity of herbal hair oil

##### Antioxidant activity:

- DPPH radical scavenging test: One ml of oil solutions (20, 30, 40, 50 and 60 µg/ml. in acetone) was added to one ml of DPPH solution (0.2mM in acetone). After a 30 min of reaction at room temperature, the absorbance of the solution was measured at 517nm. The Antioxidant activity of the oil is measured against ascorbic acid as standard

#### IV. RESULTS AND DISCUSSION

All the observation data for evaluation of Hair oil are given below -:

1	Color	Dark Green
2	Saponification value	252.44
3	Sensitivity test	No irritation
4	PH	6.75
5	Acid Value	2.65
6	Viscosity	12.01

#### RESULT

The prepared formulation is Dark green in color. The proximate analysis and qualitative chemical test were performed polyherbal hair oil using the above mentioned ingredients was evaluated for the parameter and result are tabulated below. This herbal medicated oil is beneficial for hair growth and it does not have any side effects. Prepared formulation is used to hydrate the hair and prevent frizz.

#### CONCLUSION

Herbal hair oil is one of the most well recognized hair treatments. Herbal hair oil not only moisturizes scalp but also reverses dry scalp and dry hair condition. It provides numerous essential nutrients required to maintain normal function of sebaceous glands and promotes natural hair growth. The herbal hair oil was prepared from the abovementioned ingredients and it was subjected to the qualitative chemical analysis for identification of various plant constituents. The various parameters like Color, Odour, Specific gravity (density), pH, Viscosity, Saponification value, Acid value, Refractive index and irritation test of herbal hair oil was evaluated.

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