

## Polyherbal Gel for Hair Colouring and Nourishment

Aishwarya Patil<sup>1</sup>, Mamata Bhoje<sup>2</sup>, Akanksha Patil<sup>3</sup>, Sneha Gujja<sup>4</sup>, Vanita Lokhande<sup>5</sup> (project Guide)

*Student, B Pharma, Chhatrapati Shivaji Maharaj university, School of Pharmacy, Panvel, Navi Mumbai, Maharashtra.*

*Student, B Pharma, Chhatrapati Shivaji Maharaj university, School of Pharmacy, Panvel, Navi Mumbai, Maharashtra.*

*Student, B Pharma, Chhatrapati Shivaji Maharaj university, School of Pharmacy, Panvel, Navi Mumbai, Maharashtra.*

*Student, B Pharma, Chhatrapati Shivaji Maharaj university, School of Pharmacy, Panvel, Navi Mumbai, Maharashtra.*

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### ABSTRACT

This research presents a unique polyherbal gel composition designed to transform hair coloring and hydration. The gel is made up of a carefully chosen blend of plant extracts that are well-known for their ability to color hair and improve its health. The gel's potential to nourish hair follicles and provide rich, long-lasting color has been demonstrated through a variety of scientific studies and user tests. Its natural makeup also makes it a safer alternative to traditional chemical-rich hair dyes, lowering the possibility of allergic reactions as well as harm to the hair and scalp. This polyherbal gel could be a positive development in the fight for organic and environmentally friendly hair care products. The increasing need for natural hair coloring treatments has led to the development of novel formulae; this study offers a polyherbal gel as one of them.

**KEYWORDS:** Polyherbal gel, Natural ingredient, Herbal extract, Cosmetics, Ayurvedic Skin Care, etc.

### I. INTRODUCTION

A hair styling or grooming product called polyherbal hair gel is made up of a combination of different herbal extracts or components. The word "polyherbal" denotes the formulation's usage of several different plants. These herbal extracts are frequently selected because of their possible advantages for the scalp and hair. Depending on the gel's composition and desired results, other herbs may be employed. The development and evaluation of polyherbal hair gel is a significant project in the domains of pharmaceutical and cosmetic sciences. This process involves carefully choosing and combining a number of herbal extracts and active

ingredients to create a gel that is meant to promote hair health and address common hair-related issues. The goal of the product's composition is to maximize the synergistic effects of many herbs in order to boost overall efficacy. A special formulation known as polyherbal hair gel combines the medicinal qualities of several different herbal extracts to offer all-encompassing treatments for hair-related issues. Several herbal elements are combined in the composition to create a strong, adaptable hair care solution that targets particular qualities including nourishing hair, enhancing scalp health, and treating dandruff or hair loss. The success of a formulation greatly depends on the choice of herbs, with common herbs like henna, flaxseed, alovera, amla, meethi and coffee offering special advantages including conditioning, strengthening, and antibacterial qualities. Herbal hair treatments are a useful natural therapy because they treat the root cause of hair problems. The natural ingredient in this treatment can help keep the scalp's pH balance, regulate sebum production, and eliminate harmful bacteria all of which are important for the growth and well-being of healthy hair.

### ROLE OF INGREDIENTS USED IN THE POLYHERBAL GEL FOR HAIR COLOURING AND NOURISHMENT:

**Henna:** A natural hair gel that is made from the leaves of the *Lawsonia inermis* henna plant, henna strengthens the hair shaft and gives hair a brilliant color. It is especially useful for hiding gray hairs and gives hair more volume and gloss.

**Aloe vera:** Known for its calming and hydrating qualities, aloe vera feeds the scalp, encourages healthy hair growth, and aids in moisture retention, making hair manageable and soft. Additionally, it helps shield the colour of the hair from the elements.

**Amla Powder:** Depending on the concentration used and the original colour of the hair, amla powder can give the hair a dark colour that ranges from brown to black. It is utilised as a natural substitute for synthetic hair gel, particularly by people who would rather use non-chemical products. Amla has a lot of antioxidants and vitamin C, which helps support healthy hair growth and strengthen hair follicles. It is thought to condition hair, giving it a shinier, smoother texture. Amla can help maintain a healthier scalp because of its antibacterial qualities. It might aid in lessening dandruff and other problems with the scalp, fostering an environment that is favourable to hair growth.

**Meethi:** Traditionally used in traditional medicine and beauty rituals, meethi, often referred to as fenugreek, is a herb. Meethi is thought to provide a number of advantages. Methi can occasionally be



used with other plants to give hair a naturally occurring colour. When coupled with other herbs like henna or amla, it can add to the overall hue even if it might not produce much colour on its own.





**Flaxseeds:** Packed with omega-3 fatty acids, flaxseeds can help hydrate and strengthen hair, giving it a more radiant, healthier appearance. They are frequently used to make a flaxseed gel that may be used as a deep conditioning treatment or as a natural style product on the hair. This gel helps improve the hair's natural texture and give hairstyles hold. One of the main components in flaxseed that helps prevent damage is vitamin E.

**Coffee Powder:** Coffee adds a natural sheen to hair without harming it. It improves the texture of your hair and darkens the colour. In addition to treating your hair well, it also works as a gel to enhance the colour of your hair. Using coffee instead of traditional hair dyes may improve the health of your hair. By strengthening the structure of the hair roots and strengthening the hair shaft, it promotes the formation of new hair. Caffeine's antioxidant qualities can add a natural shine and strength to hair.

## II. MATERIALS AND METHODS

### The description of the ingredients of the polyherbal hair gel:

Sr.no	Common name and Botanical name	Picture	Chemical constituents	Uses	Side effect
1	Henna (Lawsoniainermis)		Lawsonone, flavonoids, gallic acid	Colouring agent, anti fungal	Redness, itching, blister of the skin
2	Alovera (Aloe barbadensis miller)		Anthroquinone glycoside, tannis	Natural mordant nourishes hair	Rashes, hives

3	Meethi (Trigonella foenum-graecum L)		Lipids, alkaloids, protein, nitrogen compound	Make hair soft and smooth	Possibly there is no side effect
4	Flaxseeds (Linum usitatissimum)		Linseed, Linaceae	Nourishes hair, strengthens, smoothing hair.	Allergies to flaxseeds can also cause rashes and acne
5	Amla Powder (Phyllanthusemblica)		Rich in Vitamin C tannis	Anti-oxidant, maintain hair colour	Scalp dryness, dryness, hairfall and itchness
6	Coffee powder (Coffee arabica)		Caffeine, tannin, Protein	Promote hair growth and halt hair loss	Scalp burn, weakness and breakage of hair

### A] SELECTION OF INGREDIENT:

#### 1. COLOURING AGENT:

- **Henna (Lawsoniainermis):** Provides a natural reddish-brown colour.
- **Amla (Phyllanthus emblica):** Rich in vitamin C, Antioxidant, Maintain hair colour.

#### 2. NOURISHING AGENT:

- **Aloe Vera (Aloe barbadensis miller):** Provides moisture, soothes scalp.
- **Meethi (Trigonella foenum-graceumL):** It helps pigment to last longer and prevents premature greying of hair, increasing blood circulation to the scalp.
- **Coffee (Coffee Arabica):** its stimulates hair growth by boosting structure of hair roots and making shaft much sturdier.
- **Flaxseeds (Linum usitatissimum):** Rich in Omega-3 Fatty acids, increases elasticity in the hair while adding shine.

### 3. BASE GEL COMPONENTS:

- **Carbopol 940:** Gel-forming agent.
- **Distilled Water:** Solvent,
- **Preservatives: Methyl paraben**

### B] FORMULATION PROCESS:

#### Preparation of Herbal Extracts;

#### Procedure for extraction of henna:

In a rotary shaker, 10 grammes of dried henna powder were steeped in a 200 millilitre (methanol) and 200 millilitre (water) mixture for one night. Whatman No. 41 filter paper was used to filter the extract. By letting the solvent evaporate, the extract was concentrated.

#### Procedure for extraction of amla, meethi and coffee:

To make polyherbal gel, we bought the herbal ingredients such as amla, meethi, and coffee from the neighbourhood market and let them dry in the sun for three days. The dried herbal components were ground into a powder and

removed from the sieve no. 20. The desired amounts of herbal medications were then weighed, and each herb was macerated in a conical flask with rose water. Rose was allowed to mix with dried herbs



**Procedure for extraction aloe vera gel:**

The aloe leaves were cleaned and placed upright in a beaker for 15-20 min to drain out all the yellow sap present. The pulp from the aloe leaf was collected and grind it into the mixer to form liquid foam. This liquid was filtered to remove any remaining particles. Then it was boiled at 70°C to form the uniform gel and also it removes any remaining content of yellow sap if present.



**Procedure for extraction of flaxseeds:**

The seeds were boiled in water to create the flax seed extract. Constant swirling produced a thick mucilage. The mucilage was then recovered after being strained through an appropriate sieve.

**BASE GEL PREPARATION:**

**Preparation of Gel:**

1. Weigh required quantity of Carbopol 934 and dispersed in 10 ml of distilled water in beaker.
2. Keep beaker aside for half an hour to swell Carbopol 934 and then start stirring at 1200 rpm by using mechanical stirrer for 30 min.
3. Solution A: Take 3 ml of henna extract and add in 0.5 ml of Propylene glycol in one beaker and stirred properly.
4. Solution B: Add Aloe juice, Amla, coffee and other extract of herbs, and methyl Paraben in 0.5 ml of propylene glycol in another beaker.
5. Disperse Solution A and B in Carpool 934 with constant stirring.
6. Finally add remaining ml of distilled water to make up 20ml of formulation and add Triethanolamine of 1-2 drop to get the formulation of gel pH become neutral and gel get required consistency.



**FORMULATIONTABLE:-**

Sr.no	INGREDIENTS	QUANTITY	
		F1	F2
1	HENNA	3 ml	4ml
2	AMLA	1 ml	1ml
3	MEETHI	2ml	1ml

4	COFFEE	1ml	1ml
5	ALOVERA GEL	1ml	1ml
6	FLEXSEEDS GEL	2ml	2ml
7	CARBOPOL 934	3ml	4ml
8	METHYL PARABEN	0.5ml	0.5
9	TRIETHANOLAMINE	1-2 DROP	1-2 drop
10	PROPYLENE GLYCOL	1ml	1ml
11	DISTILLED WATER	20 ml	20ml
12	PERFUME	QS	QS

### C] Evaluation of the Formulation

#### 1. Physical and Chemical Tests:

- **Color and Appearance:** Assess the consistency, colour, and texture of the gel.
- **pH Measurement:** Ensure the final pH is between 7 and 8.
- **Viscosity:** Measure using a viscometer to ensure appropriate gel consistency.
- **Stability Tests:** Conduct stability tests under various conditions (e.g., temperature, humidity)

#### 2. Safety and Efficacy Testing:

- **Patch Test:** Conduct skin patch tests on human volunteers to check for allergic reactions or irritation.
- **Hair Strand Test:** Apply the gel to hair strands to evaluate colour uptake, intensity, and uniformity.

### III. RESULT AND DISCUSSION

The formula of the polyherbal gel was evaluated along a number of dimensions. Every organoleptic property—including colour, odour, homogeneity, and appearance—was visually inspected. As a result, the hue was interpreted as reddish brown. Using particles, the texture and homogeneity of the preparation on the found skin were analysed. After analysis, the pH of the formulation was shown to be skin-friendly. The spreadability quality was evaluated using glass plates, and the findings indicated that the preparation had good consistency and was spread readily. There is no redness or itching.

#### Comparison between marketed herbal dye and formulated formulation

The only traditional ingredients found in commercially available herbal hair gel formulations for hair growth are indica, henna, amla, neem, and shikakai. These traditional ingredients only have an impact on hair growth and only give reddishbrown hairs colour.

Alovera, meethi, flaxseeds, coffee powder, and other components were added to the freshly made herbal hair gel recipe. All of these components support healthy hair development and scalp function, lessen hair loss, nourish hair, and result in lustrous, smooth, and shiny hair.

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