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## DEVELOPMENT AND EVALUATION OF POLYHERBAL GEL FOR HAIR COLORING AND NOURISHMENT

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### ABSTRACT

This study introduces a novel polyherbal gel formulation designed for hair coloring and hydration enhancement. The gel combines carefully selected plant extracts renowned for their hair coloring properties and beneficial effects on hair health. Extensive scientific research and user trials have demonstrated its ability to nourish hair follicles effectively while providing vibrant, long-lasting color. The formulation's natural composition positions it as a safer alternative to conventional chemical-based hair dyes, thereby reducing the risk of allergic reactions and minimizing potential harm to both hair and scalp. This polyherbal gel represents a significant advancement in the quest for organic and environmentally friendly hair care products, responding to the growing demand for natural hair coloring solutions in contemporary beauty treatments.

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

### INTRODUCTION

Polyherbal hair gel is a hair styling and grooming product formulated with a blend of various herbal extracts and components. The term "polyherbal" signifies the use of multiple plant extracts in its composition. These herbal extracts are chosen for their potential benefits to scalp and hair health. Depending on the specific formulation and desired outcomes, additional herbs may be incorporated. The development and assessment of polyherbal hair gel represent significant endeavors in pharmaceutical and cosmetic sciences, involving meticulous selection and combination of herbal extracts and active ingredients aimed at promoting hair health and addressing common hair-related issues.

The formulation aims to maximize the synergistic effects of multiple herbs to enhance overall efficacy. Polyherbal hair gel combines the therapeutic properties of several herbal extracts to provide comprehensive hair care solutions. Various herbal ingredients are integrated into the formulation to create a robust and versatile hair care solution targeting specific qualities such as nourishment, scalp health improvement, and treatment of issues like dandruff and hair loss. The success of such formulations hinges on the careful selection of herbs, with commonly used ones like henna, flaxseed, aloe vera, amla, fenugreek, and coffee offering specific advantages such as conditioning, strengthening, and antibacterial properties. Herbal treatments for hair are valuable natural therapies as they address the root causes of hair

problems, maintain scalp pH balance, regulate sebum production, and eliminate harmful bacteria, all crucial for promoting healthy hair growth and well-being.

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

**Henna:** Derived from the leaves of the *Lawsonia inermis* plant, henna is a natural hair dye that strengthens the hair shaft and imparts vibrant color. It is particularly effective in covering gray hairs, adding volume, and enhancing hair gloss.

**Aloe vera:** Renowned for its soothing and moisturizing properties, aloe vera nourishes the scalp, promotes healthy hair growth, and helps retain moisture, resulting in manageable and soft hair. It also acts as a protective shield for hair color against environmental elements.

**Amla Powder:** Amla powder can impart dark shades ranging from brown to black, depending on its concentration and the hair's original color. It serves as a natural alternative to synthetic hair dyes, preferred by those opting for non-chemical products. Rich in antioxidants and vitamin C, amla supports healthy hair growth and strengthens hair follicles. It conditions the hair, giving it a smoother, shinier texture, and its antibacterial properties contribute to scalp health, potentially reducing dandruff and creating a favorable environment for hair growth.

**Meethi (Fenugreek):** Meethi, commonly known as fenugreek, has been traditionally used in medicinal and beauty practices. It offers various benefits and can occasionally be combined with other herbs like henna or amla to enhance hair color naturally. While it may not color hair significantly on its own, it contributes to the overall hue.

**Flaxseeds:** Packed with omega-3 fatty acids, flaxseeds hydrate and strengthen hair, imparting a radiant, healthier appearance. Often used to create flaxseed gel, they serve as a deep conditioning treatment or a natural styling product. Flaxseed gel enhances the hair's natural texture and provides hold, while vitamin E in flaxseeds helps prevent hair damage.

**Coffee Powder:** Coffee naturally enhances hair sheen without causing harm. It improves hair texture and darkens its color, functioning effectively as a natural hair dye alternative. Using coffee can contribute to healthier hair by fortifying hair roots, strengthening the hair shaft, and adding natural shine and strength due to caffeine's antioxidant properties.

## **FORMULATION PROCESS:**

### **Preparation of Herbal Extracts:**

**Procedure for extraction of Henna:** 10 grams of dried henna powder were soaked in a mixture of 200 mL methanol and 200 mL water overnight in a rotary shaker. The extract was filtered using Whatman No. 41 filter paper, and then concentrated by evaporating the solvent.

**Procedure for extraction of Amla, Meethi, and Coffee:** The herbal ingredients—amlam, meethi, and coffee—were purchased from the local market and sun-dried for three days. After drying, they were ground into a powder using a sieve no. 20. The required amounts of each herb were weighed and macerated in a conical flask with rose water to form the herbal mixture.



**Figure 1: Extraction Procedure**

### **Procedure for extraction of aloe vera gel:**

The aloe vera leaves were cleaned thoroughly and positioned upright in a beaker for 15-20 minutes to allow the yellow sap to drain out completely. The pulp extracted from the aloe leaf was ground into a mixer to create a liquid foam. This liquid was then filtered to eliminate any remaining particles. Subsequently, it was heated to 70°C to achieve a uniform gel consistency and to ensure any residual yellow sap was removed.



**Figure 2: Extraction Procedure**

### **Procedure for extraction of flaxseeds:**

The flaxseeds were boiled in water to extract the flaxseed mucilage. Continuous swirling helped in producing a thick mucilage, which was then collected after passing through an appropriate sieve.

### **Base Gel Preparation:**

#### **Preparation of Gel:**

1. Carbopol 934 was weighed out as per requirement and dispersed in 10 ml of distilled water in a beaker.
2. The beaker was set aside for 30 minutes to allow Carbopol 934 to swell, followed by stirring at 1200 rpm using a mechanical stirrer for 30 minutes.
3. Solution A: 3 ml of henna extract was added to 0.5 ml of Propylene glycol in a beaker and stirred thoroughly.
4. Solution B: Aloe juice, amla, coffee, and other herbal extracts, along with methyl Paraben, were added to 0.5 ml of propylene glycol in another beaker.
5. Solutions A and B were dispersed into the Carbopol 934 with continuous stirring.

6. Finally, additional distilled water was added to make a total volume of 20 ml for the formulation. A drop or two of Triethanolamine was added to achieve a neutral pH and to attain the desired gel consistency.



**Figure 3: Base Gel Preparation**

## RESULT AND DISCUSSION

The polyherbal gel formula underwent comprehensive evaluation across various parameters. Organoleptic properties such as color, odor, homogeneity, and appearance were visually inspected, revealing a reddish-brown hue. The texture and uniformity of the preparation were assessed on the skin using particle analysis, confirming satisfactory results. The pH of the formulation was found to be skin-friendly upon testing. Spreadability was evaluated on glass plates, demonstrating good consistency and easy spreadability without causing redness or itching.

### Comparison between marketed herbal dye and formulated formulation

Traditional herbal hair gel formulations available commercially typically include ingredients like indica, henna, amla, neem, and shikakai, which primarily focus on promoting hair growth and imparting reddish-brown color to hair. In contrast, the freshly formulated polyherbal hair gel incorporates aloe vera, fenugreek (meethi), flaxseeds, coffee powder, and other beneficial components. These ingredients collectively contribute to enhancing hair growth, reducing hair loss, nourishing hair, and yielding shiny, smooth, and healthy-looking hair.

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