

A Review of Polyherbal Anti-Dandruff Shampoo with Bay and Betel Leaves

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Abstract

Dandruff is one of the most common scalp problems, it is mainly caused by the abnormal growth of yeast Malassezia species. It can lead to itching, irritation, and excessive shedding of dead skin. Most of the anti-dandruff shampoos are made up of chemical based which are available on the market. They may give quick results, but their long-term use will show side effects like hair dryness, damage, irritation, frizziness. To overcome this problem, this study mainly emphasizes the development and analysis of herbal anti-dandruff shampoo using only plant derived ingredients like Laurus nobilis and Piper betle. These ingredients inhibit the growth of fungus as it is anti-microbial, anti-fungal, and has anti-inflammatory properties. These ingredients control excess oil production, reduce microbial growth, and help maintain scalp health. Betel leaves are very rich in eugenols, tannins, and phenolic compounds that provide anti-microbial, astringent, and anti-microbial effects. These ingredients combined help in controlling fungal growth, reduce excessive oil production, and help in maintaining the scalps health. This formulated shampoo was evaluated for parameters, such as pH, stability, and foaming ability, and gave a satisfactory result for regular use. In the end, herbal shampoo offers safe, natural alternatives to chemical-based shampoo. It helps to control dandruff and improve scalp health.

Keywords: Herbal shampoo, plant extract, anti-dandruff, bay leaf, betel leaf

INTRODUCTION

Use of Herbs in Cosmetics [1]

Under India's Drugs and Cosmetics Act of 1940, it says that plant-based ingredients are used as the herbal cosmetic products to heal and condition the skin. Many people are buying herbal plant-based cosmetics because they are safe and gentler than alternatives.

Knowing Our Hair Structure [2]

The hair growth happens from the follicles which are buried in the skin. Shaft is the part of hair which can be seen. The hair shaft has three layers. The cuticle is the layer that protects the hair. And the cortex is the other layer which gives strength to the hair and then the medulla is the core of the hair. Medulla is lightweight. Under the skin, the root of the hair sits in the follicle next to gland where the oil is produced.

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Why Shampoo Is Your Hair's Associate [3]

The shampoo is much better than soap bars as it removes the dirt and oil from the hair effectively. Water alone cannot get rid of any sebum on the scalp so we need something that can foam up and lift the dirt and then rinse clean. Conventional shampoos often contain many harmful chemicals, like sulfates and parabens, which may cause long term damage and irritation. Whereas herbal shampoo utilizes plant extracts that are mild and safe for regular uses.

HERBAL ESSENTIALS FOR HEALTHY HAIR

Herbal Ingredients:

- *Amla*: It cleanses the scalp without drying and provides natural shine by reducing hair breakage.
- *Shikakai*: Provides shine and avoid scalp from drying.
- *Neem*: It is an anti-fungal agent fighting against dandruff.
- *Bhringraj*: It helps to reduce the hair fall and provides support to the hair follicles.
- *Aloe Vera*: It is a moisturizing agent that calms the itchy scalp.
- *Onion Oil*: It has high content of Sulphur which improves blood circulation to the scalp.

Benefits of Herbal Anti-Dandruff Shampoo [4]

- Herbal-based anti-dandruff shampoo promotes healthy scalp.
- Prevents dandruff buildup.
- Makes scalp healthy and stronger hair growth.
- Gentle scalp cleansing.
- Suitable for all types of hair.
- Controls hair fall.

Breaking Down the Active Ingredients [5]

Other synthetic ingredients:

- *ketoconazole*: It is an anti-fungal agent that attacks malassezia and prevents dandruff.
- *Selenium sulfide*: It prevents fungal growth on scalp.
- *Zinc pyrithione*: Controls both fungus and bacteria. Reduces itching & irritation on scalp.
- *Coal Tar*: It is useful in conditions like psoriasis & seborrheic dermatitis.
- *Salicylic Acid*: It works by reducing inflammation and improves texture.
- *Sulfur*: Is a mild anti-fungal and anti-bacterial agent which helps to cleanse the scalp

EXPLORING DIFFERENT TYPES OF HERBAL SHAMPOOS

Types of Herbal Shampoos [6]

- *Powdered Shampoo*: This type is made up of dried & finely powered herbs like shikakai, reetha, and amla. It is mixed with water before using.
- *Jelly Shampoo*: These are transparent and thick by addition of gelling agents like cellulose.
- *Aerosol Shampoo*: They are packed in aerosol which includes propellant. The container opening is contained with valve, and the shampoo comes out in the form of foam when the valve is pressed.
- *Keratin Shampoo*: When the shampoo is infused with the keratin oil that nourishes the hair. It also protects damaging of hair from styling tools.

Evaluation Parameters [7–10]

- *Organoleptic Parameters*: Which includes color, texture, clarity, and fragrance.
- *pH Balance*: pH is measured using a digital pH meter by taking the small amount of shampoo and diluted in the distilled water.
- *Foaming*: Is done by using the cylinder shake method.
- *Viscosity*: It is measured using a viscometer that how evenly shampoo mixes in the water and to know the flow property of the shampoo and how evenly it spreads.
- *Safety Test*: Patch test on skin if no redness or irritation or inflammation is seen, hence, ensures that the product is safe to use.
- *Anti-Fungal & Anti-Microbial Activity*: Is done by using agar diffusion method where zone of inhibition is measured to determine the drug has required activity or not.
- *Spread Ability*: Surface tension is measured using a stalagmometer which helps uniform coverage of scalp.

Advanced Evaluation Technique [11]

- *Physicochemical Scans*: Includes tests for pH consistency, surface tension, density, and ingredient compatibility. It helps confirm the formula stays stable and performs well over time.

- *Microscope Magic*: Uses microscopic observation to examine particle size, uniformity, and dispersion. Reveals instabilities not visible to the naked eye.
- *Stability Metrics*: Products are stored under different temperatures and humidity conditions that help confirm self-life and reliability during storage and transport.
- *Release and Efficacy*: Checks how well the active ingredients are released during use and confirms effectiveness through visible improvement over time.
- *Safety Deep Dive*: Includes repeated use studies to ensure long-term safety that makes sure the product remains gentle even with frequent application.

PIPER BETLE (INDIAN BETEL LEAF) [12]

Piper betle is an aromatic and medicinal plant widely cultured in India and other Asian countries. They are commonly called betel leaves and traditionally used in Ayurveda for their refreshing and therapeutic properties (Figure 1).



Figure 1. Indian betel leaf.

- *Synonyms*: Betel vine, nagavalli, paan leaf.
- *Common Name*: Indian betel leaf, betel leaf.
- *Biological Sources*: It consists of the fresh and dried leaves of *Piper betle* Linn.
- *Family*: Piperaceae.

Chemical Composition

They contain several bioactive compounds such as chavicol, eugenol, hydroxychavicol, tannins, flavonoids, and essential oils. Its anti-microbial and anti-oxidant properties make it useful in herbal formulations, specifically in skin, and scalp preparations. The leaf extract will also show anti-inflammatory and anti-fungal activity.

CINNAMOMUM TAMALA (Bay Leaf) [13]

Cinnamomum tamala, commonly known as Indian bay leaf, is a traditional and aromatic plant widely used in cooking. The leaves have a warm fragrance and contain medicinal components. They contain anti-oxidant and anti-microbial properties (Figure 2).

- *Synonyms*: Indian bay leaf, Tejpatta, Malabar leaf.
- *Common Name*: Bay leaf, Indian Bay leaf.
- *Biological Source*: It consists of the dried leaves of *Cinnamomum tamala* belonging to the Lauraceae family.
- *Family*: Lauraceae.



Figure 2. Indian bay leaf.

Chemical Components

It contains essential oils such as cinnamaldehyde, eugenol, linalool, and terpenoids. They also contain flavonoids, tannins, alkaloids, carbohydrates, and phenolic compounds responsible for their medicinal and anti-oxidant activities.

It improves digestion, reduces inflammation, and supports respiratory health. Due to its anti-microbial and anti-oxidant properties, it is also included in herbal cosmetic and hair care preparations.

Advantages

- Helps control microbial growth.
- Possesses natural anti-oxidant activity.
- Has anti-inflammatory and anti-microbial properties.
- Improves fragrance in formulations.

Disadvantages

- Excessive use may produce dryness in some formulations.
- Strong essential oil content may irritate sensitive skin.
- Requires proper drying and storage to maintain quality.

CONCLUSION

In the end, herbal anti-dandruff shampoos offer a simple yet effective way to deal with a flaky scalp and other issues without harming the natural strength of the hair. They cover all the essentials from maintaining the pH, cleansing deeply, producing lather and staying stable over time making them easy to include in day-to-day routines. The natural ingredients present work gently to control microbes, calm irritation and support healthy hair growth all while maintaining calmness on the scalp. Unlike strong chemical-based products that can potentially damage the hair these are much milder and comforting to use. By combining the benefits of natural ingredients with a hint of modern formulation they help maintain healthier, softer, stronger and more manageable hair over time.

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