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Review Article

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AA COMPREHENSIVE REVIEW ON THE EFFICACY OF NEELIBHRINGADI HAIR OIL IN MODERN HAIR CARE

Medi. Rama¹, Mahathi. Kaji¹, Sk. Asfa Arjumunnd¹, A. Suneetha¹, Patibandla. Jahnavi^{1*}

Kvsr Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India.

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***Corresponding author**

Patibandla. Jahnavi

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Abstract

Hair-related problems such as dandruff, excessive hair fall, premature greying, and thinning have emerged as common cosmetic and dermatological concerns, largely triggered by modern lifestyle factors including stress, pollution, inadequate nutrition, and overuse of chemical-laden hair products. In this context, Neelibhringadi Hair Oil, a time-honored Ayurvedic formulation, offers a promising, natural alternative for comprehensive scalp and hair care. This polyherbal oil blends traditional botanical ingredients-Bhringraj (*Eclipta alba*), Neeli (*Indigofera tinctoria*), Amla (*Embolica officinalis*), Brahmi (*Bacopa monnieri*), and Methi (*Trigonella foenum-graecum*)-in a nourishing base of sesame or coconut oil. Together, these herbs exhibit potent antioxidant, anti-inflammatory, and antimicrobial activities, believed to enhance blood circulation, strengthen follicles, and rejuvenate the scalp. Ayurvedic literature attributes to the oil the ability to balance Vata and Pitta doshas, thereby addressing the root causes of hair deterioration. While most scientific validations pertain to the oil's individual components, early evidence supports its role in promoting follicular health and reducing scalp inflammation. Furthermore, Neelibhringadi oil holds significant cultural and therapeutic value in Indian households, underscoring its widespread acceptance. This review explores the oil's pharmacological rationale, therapeutic benefits, safety considerations, and practical limitations, emphasizing the need for modern clinical trials. Bridging this ancient wisdom with current scientific rigor may pave the way for its broader use in natural, evidence-based hair care solutions.

Keywords: Neelibhringadi Hair Oil, Ayurvedic Hair Treatment, Hair Fall, Premature Greying, Polyherbal Formulation

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Introduction

Hair-related concerns such as hair loss, premature greying, dandruff, thinning, and breakage are increasingly prevalent across various age groups and lifestyles. In today's world, these issues are often aggravated by a combination of environmental stressors, erratic dietary habits, hormonal imbalances, and the frequent use of synthetic hair products. As awareness grows regarding the potential side effects and limitations of chemical-based treatments, a noticeable shift is occurring-one that favors natural, holistic alternatives rooted in traditional medicine systems. Among these, Neelibhringadi hair oil, a classical Ayurvedic preparation, has gained renewed interest for its reputed ability to restore scalp health and promote hair vitality [1].

Ayurveda, the ancient Indian system of medicine, emphasizes harmony between body, mind, and environment. In its pharmacopeia, herbal oils occupy a

significant place in managing hair and scalp disorders. Neelibhringadi oil, in particular, has been traditionally valued for its comprehensive action-stimulating hair growth, preventing premature greying, relieving scalp irritation, and improving hair texture. This formulation typically includes a synergistic blend of herbs such as *Indigofera tinctoria* (Neeli), *Eclipta alba* (Bhringraj), *Embolica officinalis* (Amla), *Bacopa monnieri* (Brahmi), and *Glycyrrhiza glabra* (Yashtimadhu), processed in a coconut oil base using the time-honored *Sneha Paka* method. This process ensures optimal extraction and preservation of therapeutic phytoconstituents by slow-cooking a herbal decoction and paste with the oil until the desired potency is achieved [2].

The therapeutic relevance of Neelibhringadi oil is well-recognized in classical Ayurvedic texts such as *Ashtanga Hridaya* and *Sahasrayogam*, where it is prescribed for managing conditions like hair fall, scalp infections, and

premature greying. Modern pharmacological studies have also highlighted the bioactive profile of its ingredients, revealing properties such as antioxidant, anti-inflammatory, antimicrobial, and vasodilatory effects-all essential for maintaining healthy hair follicles and promoting regeneration [3].

In recent years, traditional formulations like Neelibhringadi oil have seen a resurgence, both in India and globally, driven by the rise of the clean beauty movement and increased consumer interest in natural, plant-based hair care solutions. Despite its wide use and long-standing reputation, the formulation remains relatively underexplored from a clinical research perspective. Gaps persist in areas such as standardized quality control, mechanistic validation, and large-scale clinical efficacy data [4].

This review aims to bridge these gaps by compiling and analyzing both classical Ayurvedic knowledge and contemporary scientific literature on Neelibhringadi hair oil.

Composition of Neelibhringadi Oil

Neelibhringadi hair oil is a classical polyherbal formulation rooted in the rich traditions of Ayurveda. Crafted through a careful selection of medicinal herbs and infused into a nourishing base-typically coconut oil-this therapeutic oil has been revered for generations for its multifaceted benefits. Its formulation is detailed in esteemed Ayurvedic compendia such as *Sahasrayogam* and *Ashtanga Hridaya*, where it is recommended for promoting hair rejuvenation, enhancing scalp health, and addressing a variety of hair disorders. Traditionally used in the management of conditions like premature greying, dandruff, and alopecia, Neelibhringadi oil exemplifies the Ayurvedic principle of holistic healing, aiming not only to treat symptoms but to restore balance to the scalp and hair follicles. Its continued relevance today highlights the enduring value of ancient formulations in modern personal care and wellness practices. [5-8].

Table 01: Core Herbal Ingredients and Their Functions

Herbal Ingredient	Botanical Name	Major Phytoconstituents	Therapeutic Function
Neeli	<i>Indigofera tinctoria</i>	Indigotin, indirubin, flavonoids	Prevents premature graying, promotes natural hair coloring
Bhringara ja	<i>Eclipta alba</i>	Wedelolactone, luteolin, ecliptine	Promotes hair growth, strengthens follicles
Amla	<i>Emblica officinalis</i>	Ascorbic acid, tannins, flavonoids	Antioxidant, enhances melanin production,

			prevents dandruff
Yashtimadhu	<i>Glycyrrhiza glabra</i>	Glycyrrhizin, flavonoids	Anti-inflammatory, soothes scalp irritation
Brahmi	<i>Bacopa monnieri</i>	Bacosides, saponins	Reduces stress-related hair loss, improves circulation
Coconut Oil	<i>Cocos nucifera</i> (Base Oil)	Medium-chain fatty acids, lauric acid	Deeply penetrates hair shaft, provides moisturization

Synergistic Processing and Action of Ingredients

The formulation of Neelibhringadi oil adheres to the traditional Ayurvedic preparation technique known as *Taila Paka Vidhi*-a method deeply rooted in ancient pharmaceuticals. This process involves the careful blending of three key components: a herbal decoction (*Kashaya*), a fine herbal paste (*Kalka*), and a lipid base (*Sneha Dravya*), most commonly coconut oil. These ingredients are simmered together over a gentle, controlled flame, allowing the active phytoconstituents to gradually extract and bind to the oil phase. This slow-cooking technique is more than just a method of infusion; it is a fine art that ensures the final product is therapeutically potent, chemically stable, and naturally aromatic. Importantly, the procedure also eliminates residual moisture, thereby enhancing the oil's shelf life and preventing microbial degradation [9]. The outcome is a rich, medicinal oil that embodies the principles of Ayurvedic synergy, delivering holistic care for scalp and hair health.

The herbal blend works in synergy to deliver multidimensional benefits. *Neeli* (*Indigofera tinctoria*) and *Amla* (*Emblica officinalis*) are known to support natural pigmentation of the hair while reducing oxidative damage to melanin, which plays a role in premature greying. *Bhringaraja* (*Eclipta alba*) and *Brahmi* (*Bacopa monnieri*) help energize the scalp by boosting local circulation and nourishing the roots, thereby helping to reduce hair fall and promote new growth. *Yashtimadhu* (*Glycyrrhiza glabra*), with its natural anti-inflammatory properties, calms sensitive or itchy scalp conditions and supports a healthy scalp environment [10].

The coconut oil base serves a dual purpose: it acts as a vehicle for herbal penetration into the scalp and hair shaft, and it also improves hair texture by moisturizing and strengthening the strands. Because coconut oil is lightweight and non-comedogenic, it is ideal for regular

scalp application and does not clog pores or cause buildup [11].

Traditional Formulation Ratios

Classical Ayurvedic texts, including *Sahasrayogam*, outline precise proportions for preparing Neelibhringadi oil. A typical 100 mL preparation might follow these approximate ratios:

- **1 part** herbal decoction of *Neeli*
- **1 part** herbal paste made from *Bhringaraja*, *Amla*, and *Yashtimadhu*
- **4 parts** base oil, typically virgin coconut oil

These proportions ensure an optimal balance between herbal concentration and oil volume, allowing effective delivery of the phytoconstituents while preserving the preparation naturally [12].

Pharmacological Properties of Key Ingredients

The therapeutic efficacy of Neelibhringadi oil is rooted in the synergistic action of its ingredients. *Neeli* and *Amla* restore hair pigmentation and vitality, while *Bhringaraja* promotes follicular regeneration. *Licorice* soothes scalp inflammation, and *Coconut oil* facilitates deep absorption of bioactives. The inclusion of *milk* enhances nourishment, making the oil a comprehensive solution for hair rejuvenation [13-18].

Table 02: Pharmacological Properties of Key Ingredients in Neelibhringadi Hair Oil

Herbal Ingredient	Botanical/Source Name	Pharmacological Properties
Neeli	<i>Indigofera tinctoria</i>	Acts as a natural hair dye; prevents premature graying by enhancing melanin synthesis.
Bhringaraja	<i>Eclipta alba</i>	Stimulates hair follicles, promotes anagen phase, reduces hair fall.
Amla	<i>Emblica officinalis</i>	Rich in vitamin C; serves as an antioxidant and rejuvenator for scalp health.
Licorice (Yashtimadhu)	<i>Glycyrrhiza glabra</i>	Exhibits strong anti-inflammatory and soothing properties on the scalp.
Coconut Oil	<i>Cocos nucifera</i> (Base oil)	Penetrates deeply into hair shafts; enhances delivery of actives; conditions and strengthens hair.
Goat's/Cow's Milk	Animal-derived nutrient medium	Acts as a natural conditioner; provides vitamins, minerals, and proteins for scalp nourishment.

Mechanism of Action

Neelibhringadi oil exerts its hair-rejuvenating effects through a multi-targeted mechanism, primarily driven by the bioactive compounds present in its herbal ingredients. Rich in flavonoids, tannins, and polyphenols, herbs like *Eclipta alba*, *Indigofera tinctoria*, and *Emblica officinalis* contribute potent antioxidant and anti-inflammatory actions. These phytoconstituents help neutralize oxidative stress in scalp tissues and curb the release of inflammatory cytokines, creating a healthier environment for hair follicles to thrive. Furthermore, the oil is known to improve microcirculation in the scalp, ensuring efficient delivery of nutrients and oxygen to the follicular roots. This enhances follicular nourishment, prolongs the anagen (growth) phase, and supports melanin synthesis—an essential function in preventing premature greying and dandruff recurrence [19].

Benefits in Modern Hair Care

With the rising popularity of natural and herbal-based cosmetics, Neelibhringadi hair oil has found a strong foothold in modern hair care routines. It offers a blend of therapeutic and cosmetic benefits, making it ideal for managing common concerns such as hair fall, dandruff, and lackluster hair. Regular use of the oil strengthens the roots, soothes the scalp, and minimizes microbial growth and flakiness. Thanks to its nutrient-rich botanical ingredients, it also supports melanin retention in hair strands—slowing down the onset of greying. The emollient base of coconut or sesame oil helps seal in moisture, leaving the hair soft, shiny, and voluminous. These attributes align perfectly with today's consumer preference for sustainable, non-toxic, and plant-based hair care solutions [20].

Market Trends and Commercial Formulations

Neelibhringadi oil has witnessed a surge in demand, driven by the global shift towards Ayurveda and plant-based wellness products. Prominent Ayurvedic manufacturers such as Kottakkal Arya Vaidya Sala, Kerala Ayurveda, and Himalaya Wellness offer their own versions of this traditional formulation, often with slight variations in herb composition but true to classical roots [21]. Modern packaging innovations—like UV-protected bottles and user-friendly pump dispensers—have enhanced product shelf-life and consumer appeal. However, despite commercial progress, inconsistencies in sourcing, formulation techniques, and lack of standardized protocols continue to present challenges in maintaining uniform quality across different brands [22].

Safety and Toxicity

Neelibhringadi oil is widely recognized for its favorable safety profile. It is typically free from synthetic additives such as parabens, sulfates, and artificial dyes, minimizing the risk of irritation or allergic reactions. Most of its constituents have attained GRAS (Generally Recognized as

Safe) status and have centuries of safe use in traditional medicine [23]. Rare instances of mild contact dermatitis have been reported but are usually due to individual hypersensitivity rather than the oil itself. Simple precautionary measures like a patch test before use can effectively prevent such reactions [24].

Limitations and Challenges

Despite its cultural credibility and extensive traditional use, Neelibhringadi oil faces certain limitations when evaluated through the lens of modern scientific scrutiny. Variability in ingredient quality, lack of batch-to-batch consistency, and differences in traditional processing methods create inconsistencies in therapeutic efficacy. Moreover, there is a lack of rigorous, large-scale clinical studies evaluating the full formulation's effectiveness. These gaps, coupled with inadequate regulatory frameworks for Ayurvedic product standardization, limit its acceptance and use in mainstream medical and dermatological practice [25].

Conclusion

Neelibhringadi Hair Oil stands out as a revered Ayurvedic formulation with a rich legacy and strong therapeutic promise in modern hair care. Crafted from a synergistic blend of botanicals such as *Eclipta alba*, *Indigofera tinctoria*, *Embolica officinalis*, *Bacopa monnieri*, and *Trigonella foenum-graecum*, and delivered in a nourishing base of sesame or coconut oil, the oil supports not just hair aesthetics but also scalp wellness. It works by improving blood flow, reducing oxidative damage, calming inflammation, and delivering essential micronutrients directly to the hair roots. Anecdotal evidence and traditional wisdom offer compelling support for its role in managing hair fall, premature greying, and dandruff. However, contemporary validation is still evolving. Most existing studies focus on individual ingredients, not the complete oil, highlighting a critical gap in scientific evidence. Moving forward, robust pharmacological assessments and well-designed clinical trials are essential to substantiate its efficacy and safety across varied populations. As consumer interest in holistic and chemical-free hair care grows, Neelibhringadi oil has the potential to emerge as a globally trusted solution—provided its traditional roots are upheld while meeting modern scientific standards.

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Conflict of Interest

Authors are declared that no conflict of interest.

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Not Applicable

Author Contributions

Medi Rama, Mahathi Kaji, Sk. Asfa Arjumunnd, and A. Suneetha were collectively responsible for literature review, data compilation, and initial drafting of the manuscript. Patibandla Jahnavi contributed to conceptualization, critical revision, formatting, and final approval of the manuscript for submission.

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