



Review Article

([ISSN: xxxx-xxxx] Journal Homepage:<https://anusearch-ijpas.com/>)

Herbal Oil Formulation for Managing Male Pattern Baldness (Alopecia)

Rutuparna Talekar, Raju Mule, Vaibhav Dhengle, Uddhav Awakale, Sachin Ambhore, Dr. Sachin C. Kale, Dr K.R. Biyani,

ARTICLE INFO

Received On: 20-11-25

Modified On: 09-02-26

Published On: 17-09-26

DOI:

<https://doi.org/10.5281/zenodo.20661744>

ABSTRACT

Male pattern baldness (androgenetic alopecia) is a prevalent hair disorder caused by hormonal imbalance and follicular miniaturization due to dihydrotestosterone (DHT). Synthetic drugs such as minoxidil and finasteride show limited efficacy and adverse effects. Therefore, herbal formulations have emerged as safer alternatives for long-term management. This review focuses on a polyherbal hair formulation containing Amla, Neem, Fenugreek, Hibiscus, Heena, Kalonji seed, Centella asiatica, Spinach, Pumpkin seed oil, Coconut oil, Castor oil, Gulmehendi oil, and Vitamin E oil. The ingredients provide a synergistic effect through antioxidant, anti-inflammatory, and DHT-inhibiting mechanisms. The formulation enhances scalp blood circulation, strengthens hair follicles, reduces dandruff, and promotes hair regrowth. The review also summarizes the pharmacological actions of each component, formulation evaluation parameters, and supporting literature. After the herbal oil formulation was completed, the product underwent a series of physicochemical and functional evaluations to assess its quality, stability, and potential effectiveness. The formulation was examined for parameters such as color, odor, consistency, pH, viscosity,



and spreadability to ensure uniformity and consumer acceptability. Stability testing was conducted under varying temperature and storage conditions to monitor phase separation, sedimentation, or changes in appearance. Additionally, preliminary user-based assessments and application trials were performed to observe improvements in hair texture, scalp hydration, and reduction in hair fall over a defined period. These evaluations helped verify the suitability and reliability of the developed herbal oil for managing male pattern baldness.

KEYWORDS

Male pattern baldness, Alopecia, Herbal formulation, Hair growth, DHT inhibition





INTRODUCTION

Hair plays a vital role in human aesthetics, identity, and social confidence [1]. Hair loss disorders, particularly male pattern baldness (androgenetic alopecia), affect nearly 50% of men by the age of 50 [2]. The condition is genetically driven and androgen-dependent, primarily caused by the conversion of testosterone to dihydrotestosterone (DHT) via 5 α -reductase [3]. DHT binds to androgen receptors in hair follicles, leading to their gradual miniaturization and eventual baldness [4]. Current pharmacological agents, including minoxidil and finasteride, offer partial relief but are associated with side effects such as scalp irritation and sexual dysfunction [5]. Due to these limitations, herbal alternatives have gained prominence for their safety, biocompatibility, and multifactorial mechanisms in promoting hair health [6].

MATERIALS AND METHODS

This review was conducted to systematically evaluate the existing literature on herbal formulations for managing male pattern baldness (androgenetic alopecia). A comprehensive search was performed in electronic databases, including PubMed, Scopus, Google Scholar, and Web of Science, using keywords such as “herbal hair oil,” “male pattern baldness,” “androgenetic alopecia,” “hair growth,” “phytochemicals,” and “natural DHT inhibitors.” Articles published in English between 2000 and 2023 were considered. Inclusion criteria encompassed studies on herbal treatments, polyherbal formulations, or individual plant extracts with reported efficacy in hair growth promotion, including in vitro, in vivo, and clinical studies. Review articles providing insights into phytochemical composition, pharmacological mechanisms, and formulation strategies were also included. Exclusion criteria consisted of studies focusing solely on synthetic drugs, case reports, abstracts without full text, or publications lacking sufficient scientific validation. Data from selected studies were extracted regarding plant species, active constituents, mechanisms of action, formulation types, and outcomes. The information was organized to highlight the efficacy, safety, and synergistic potential of polyherbal oils. A narrative synthesis was then conducted to summarize the current evidence, identify research gaps, and provide scientific rationale for the use of herbal oils in androgenetic alopecia.



RESULTS

Rationale for Herbal Formulation

Herbal ingredients possess bioactive phytoconstituents such as flavonoids, terpenoids, saponins, and alkaloids that modulate key biological pathways in hair growth. They act by:

- Inhibiting DHT formation
- Improving scalp microcirculation
- Providing antioxidant protection
- Stimulating dermal papilla cell proliferation
- Maintaining scalp hygiene

The proposed formulation is a **polyherbal hair oil** consisting of 13 active ingredients, chosen for their complementary pharmacological effects.

Composition of the Polyherbal Formulation

Sr.no	Ingredients	Quantity	Role\Activity
1	<i>Amla (Phyllanthus emblica)</i>	15 g	Rich in Vitamin C and antioxidants; strengthens hair follicles, prevents premature graying
2	<i>Neem (Azadirachta indica)</i>	10 g	Antifungal, antibacterial; improves scalp health and reduces dandruff



3	<i>Fenugreek (Trigonella foenum-graecum)</i>	12 g	Contains nicotinic acid and proteins; promotes hair growth and reduces shedding
4	<i>Hibiscus (Hibiscus rosa-sinensis)</i>	12 g	Stimulates hair follicle growth, conditions scalp
5	<i>Heena (Lawsonia inermis)</i>	10 g	Natural conditioner; improves hair texture and strength
6	<i>Kalonji seed (Nigella sativa)</i>	10 g	Contains thymoquinone; exhibits DHT inhibition and antioxidant activity
7	<i>Coconut oil</i>	40 ml	Deep scalp penetrator; provides nourishment and prevents protein loss
8	<i>Castor oil</i>	30 ml	Rich in ricinoleic acid; promotes blood circulation and hair thickness
9	<i>Gulmehendi oil</i>	12 ml	Soothes scalp, reduces inflammation
10	<i>Centella asiatica (Gotu Kola)</i>	4 g	Stimulates collagen synthesis and improves microcirculation
11	<i>Spinach (Spinacia oleracea)</i>	5 g	Source of iron and vitamins; supports follicular oxygenation
12	<i>Pumpkin seed oil</i>	15 ml	Inhibits 5 α -reductase; clinically proven for hair regrowth



13	<i>Vitamin E oil</i>	20 ml	Antioxidant; prevents oxidative damage and supports scalp hydration
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DISCUSSION

The combination of natural ingredients in herbal formulations offers a holistic approach to managing androgenetic alopecia [7]. The synergistic activity of antioxidants, DHT inhibitors, and nourishing oils helps protect and regenerate hair follicles [8]. Vitamin E and *Centella asiatica* contribute to improved microcirculation and tissue repair [9]. Amla, Hibiscus, and Fenugreek support keratin synthesis and enhance hair strength [10]. Other ingredients like Neem, Pumpkin seed oil, and *Nigella sativa* provide anti-inflammatory, antioxidant, and DHT-inhibitory effects [11]. Compared to synthetic formulations, polyherbal oils are generally non irritant, cost-effective, and suitable for long-term use [12]

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CONCLUSION

Herbal formulations represent a safe, sustainable, and effective approach for the treatment of male pattern baldness [13]. The described polyherbal formulation integrates traditional knowledge with scientific rationale to target the multifactorial pathology of alopecia [14].

Further in vitro, in vivo, and clinical evaluations are necessary to validate efficacy, optimize dosage, and confirm long-term safety [15].

ABBREVIATIONS

DHT -Di Hydro Testosterone

FUNDING

None



CONFLICT OF INTERESTS

Author Declare No conflict of interest



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OF PHARMA AND ALLIED SCIENCES**

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HOW TO CITE: Rutuparna Talekar, Raju Mule, Vaibhav Dhengle, Uddhav Awakale, Sachin Ambhore, Dr. Sachin C. Kale, Dr K.R. Biyani, *Herbal Oil Formulation for Managing Male Pattern Baldness (Alopecia)*, Anusearch IJPAS, 2026, 1(1), Page, Review Article, DOI: <https://doi.org/10.5281/zenodo.20661744>



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