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Review Article

A Review on Herbal Hair Oil

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ABSTRACT

Herbal hair oils have been an integral part of traditional and modern hair care systems owing to their nourishing, therapeutic, and cosmetic benefits. Unlike synthetic hair oils, herbal formulations harness the power of natural ingredients—such as Amla (Emblica officinalis), Bhringraj (Eclipta alba), Brahmi (Bacopa monnieri), Neem (Azadirachta indica), and Hibiscus (Hibiscus rosasinensis)—known for their ability to promote hair growth, prevent dandruff, reduce hair fall, and enhance scalp health. These botanicals offer multifactorial effects including antifungal, antibacterial, antioxidant, and anti-inflammatory properties that address common hair and scalp issues. The selection of base oils like coconut, sesame, almond, and castor further enhances the efficacy by acting as carriers and moisturizers. Various extraction methods such as maceration, decoction, infusion, and Soxhlet extraction influence the yield and effectiveness of phytoconstituents. Recent advancements in analytical tools have enabled quality control through techniques like HPTLC, GC-MS, and FTIR. This review explores the traditional knowledge, modern formulations, and key herbal ingredients, mechanisms of action, evaluation parameters, and regulatory aspects of herbal hair oil. Emphasis is also laid on recent clinical trials, consumer preferences, and market trends. Overall, herbal hair oils continue to gain acceptance due to their safety profile, efficacy, and holistic action on hair and scalp health.

INTRODUCTION

Importance of hair in health and beauty-

Hair plays a vital role in defining an individual's appearance, personality, and cultural identity. Beyond aesthetics, hair reflects internal health, hormonal balance, and nutritional status. Strong, shiny, and voluminous hair is often considered a sign of youth and vitality, while hair loss or damage may be linked to stress, poor diet, or underlying health issues. Healthy hair boosts self-esteem and social confidence, especially in modern society where beauty standards are strongly emphasized. As a result, maintaining hair

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through proper care is crucial not only for cosmetic appeal but also as a part of holistic well-being and hygiene[1-5].

Rising demand for herbal hair care products-

In recent years, there has been a significant shift in consumer preference toward herbal and natural hair care products due to increasing awareness about the harmful effects of synthetic chemicals. Consumers are more inclined to use products that are free from parabens, sulfates, silicones, and artificial fragrances. Herbal hair oils made from natural plant extracts are gaining popularity for their perceived safety, minimal side effects, and holistic benefits. Moreover, the global trend toward sustainability and eco-consciousness has accelerated the demand for herbal formulations that align with traditional wisdom and Ayurvedic principles while addressing modern hair care concerns[6-8].

Disadvantages of synthetic hair oils-

Synthetic hair oils often contain mineral oils, artificial fragrances, colorants, and preservatives that may lead to scalp irritation, allergic reactions, or hair fall upon prolonged use. These chemicalbased formulations can block pores, interfere with natural sebum production, and contribute to dry scalp or dandruff. Some synthetic compounds may even contain endocrine disruptors or carcinogens, raising safety concerns. Furthermore, synthetic oils typically offer only superficial gloss without addressing the root causes of hair damage. Their lack of therapeutic action has led many consumers to reconsider their use, driving the transition toward more effective and safer herbal alternatives[9-11].

Role of traditional knowledge in formulation-

Traditional systems like Ayurveda, Siddha, and Unani have long emphasized the use of herbal oils for hair health. These systems describe specific herbs and oils tailored for different hair types and conditions, offering a wealth of empirical data on their safety and efficacy. Traditional formulations are typically based on natural ingredients like Amla, Bhringraj, Brahmi, and coconut oil, believed to nourish the scalp and rejuvenate hair follicles. By blending ancient wisdom with modern scientific validation, formulators can create more effective and consumer-acceptable herbal hair oils. This knowledge also forms the basis for polyherbal synergy, where herbs work in harmony to offer enhanced benefits[12-15].

Overview of commonly used herbs-

Several herbs are widely used in herbal hair oil formulations due to their proven benefits. Amla (Emblica officinalis) is rich in vitamin C and antioxidants, promoting hair growth and preventing premature greying. Bhringraj (Eclipta Alba) enhances follicle health and combats hair loss. Brahmi (Bacopa monnieri) strengthens roots and reduces stress-induced hair fall. Neem (Azadirachta indica) offers antifungal and antibacterial action, making it effective against dandruff. Hibiscus (Hibiscus rosa-sinensis) stimulates growth and adds shine. Fenugreek (Trigonella foenumgraecum) conditions the scalp and prevents dryness. Together, these herbs address multiple aspects of hair care, making them ideal for holistic formulations[16-18].

Pharmacological effects of herbal extracts-

Herbal extracts used in hair oils possess diverse pharmacological properties beneficial for scalp and hair health. Many contain antioxidants that neutralize free radicals, preventing follicular damage and aging. Anti-inflammatory compounds reduce scalp irritation and soothe itching.

Antimicrobial agents fight dandruff-causing fungi and bacteria. Certain herbs act as vasodilators, improving blood circulation to the scalp and enhancing nutrient delivery to hair roots. Phytoestrogens from some plants can mimic hormonal action, potentially countering hormonal hair loss. Additionally, adaptogens like Brahmi may reduce stress, a major factor in hair fall. These multifaceted pharmacological actions make herbal extracts superior to inert synthetic agents[19].

Importance of base oils (coconut, sesame, and castor)-

Base oils serve as carriers that dissolve herbal extracts and facilitate their absorption into the scalp and hair shafts. Coconut oil is widely favored for its deep penetration, lauric acid content, and antimicrobial properties. Sesame oil is rich in linoleic acid and antioxidants, promoting scalp nourishment and preventing greying. Castor oil, known for its thick viscosity and ricinoleic acid, enhances hair growth and adds volume. These oils not only improve herbal extract delivery but also offer their own conditioning and healing benefits. The choice of base oil greatly influences the formulation's texture, efficacy, and consumer acceptability in herbal hair oils[20].

Extraction techniques for herbal oils-

The extraction technique determines the yield, potency, and stability of bioactive compounds in herbal hair oils. Cold maceration preserves thermolabile compounds and is ideal for essential oils. Hot infusion and boiling methods are traditional techniques used to extract active constituents into base oils like coconut or sesame. Soxhlet extraction offers efficient recovery of phytoconstituents but may degrade heat-sensitive compounds. Ultrasound-assisted and microwave-assisted extraction are modern techniques enhancing efficiency and reducing time. The choice of solvent, temperature, and duration is crucial to maintaining the therapeutic efficacy of herbal oils. Proper extraction ensures maximum benefits without altering the chemical profile of the actives[20].

Literature survey[21-40]:

1. **Kumar et al. (2018)** – Studied the effectiveness of herbal oils containing *Bhringraj* and *Amla*. Results showed significant hair growth-promoting activity in albino rats. The study highlighted that combining multiple herbal extracts enhances therapeutic efficacy.

2. **Rathi et al. (2017)** – Evaluated the hair growth activity of *Hibiscus rosa-sinensis* extract in a coconut oil base. The extract increased hair length and follicle count, demonstrating its potential in treating alopecia.

3. **Sharma and Shukla (2016)** – Formulated an herbal hair oil using *Brahmi*, *Neem*, and *Henna*. The formulation improved hair texture and reduced dandruff after 30 days of application.

4. **Patel et al. (2019)** – Investigated *Fenugreek*-infused hair oil, showing it reduced hair fall and improved scalp hydration. The oil also showed antifungal activity against *Malassezia* spp.

5. **Saxena et al. (2020)** – Focused on *Amla*-based hair oil and its antioxidant activity. The study demonstrated that amla extract protects hair follicles from oxidative stress and promotes melanin production.

6. **Jain and Tiwari (2015)** – Reported that *Tulsi*-enriched herbal oil significantly reduces hair fall and improves blood circulation to the scalp, enhancing follicle nourishment.

7. **Khandelwal et al. (2021)** – Used *Aloe Vera*, *Castor oil*, and *Henna* to create a polyherbal oil. Clinical trials indicated reduced split ends and improved hair volume in users.

8. **Sahu et al. (2016)** – Assessed the efficacy of herbal oils containing *Curry leaves* and *Neem*. Showed antimicrobial activity and reduction of scalp irritation.

9. **Dixit and Sharma (2022)** – Developed a polyherbal hair oil with *Bhringraj*, *Jatamansi*, and *Coconut oil*. The oil was tested on volunteers and showed hair regrowth within 6 weeks.

10. **Mishra et al. (2020)** – Formulated a *Rosemary* and *Peppermint*-based oil, which increased hair shaft length and density after 4 weeks of use.

11. **Verma et al. (2018)** – Demonstrated that *Onion extract*-infused oil significantly reduced alopecia-related symptoms by enhancing keratin synthesis.

12. **Naik et al. (2019)** – Compared synthetic vs. herbal hair oils. The herbal variant containing *Amla*, *Neem*, and *Coconut oil* showed fewer side effects and greater user satisfaction.

13. **Rao and Kulkarni (2021)** – Studied the penetration capability of oils. *Sesame oil* was most effective as a base for deeper herb delivery into hair follicles.

14. **Ghosh and Gupta (2016)** – Developed an oil using *Shikakai* and *Reetha*. The oil cleaned scalp impurities effectively while conditioning the hair naturally.

15. **Prasad et al. (2022)** – Used Nano emulsion techniques to develop herbal hair oil for improved bioavailability. The oil showed enhanced shelf-life and user acceptability.

Future Scope of Study[31-35]:

1. Nanotechnology integration to enhance penetration and stability of herbal actives in hair oil.

2. Standardization of herbal ingredients to ensure reproducible efficacy.

3. Development of targeted formulations for specific hair conditions like alopecia or dandruff.

4. Clinical trials on diverse populations to validate traditional claims with scientific data.

5. Exploration of underutilized herbs with ethnobotanical significance.

6. Formulation of organic-certified oils for growing eco-conscious consumers.

7. Biotechnological extraction techniques for higher yield of active compounds.

8. Combination of herbal and nutraceutical approaches for hair nourishment.

9. Application of AI in consumer profiling to offer personalized herbal oil solutions.

10. Global market expansion potential with product innovation and sustainability focus.

CONCLUSION:

Herbal hair oils have emerged as a promising alternative to synthetic hair care products due to their natural origin, minimal side effects, and holistic approach to hair health. The extensive traditional knowledge regarding herbs like *Amla*, *Bhringraj*, *Neem*, *Hibiscus*, *Tulsi*, and *Aloe vera*

has laid the foundation for formulating effective and safe hair oils. These herbs are known to possess a wide range of pharmacological properties including anti-inflammatory, antifungal, antioxidant, and hair growth-promoting effects. Scientific validation through in vitro and in vivo studies has demonstrated the efficacy of herbal oils in reducing hair fall, enhancing hair growth, improving scalp health, and maintaining hair strength and shine. Base oils like *Coconut*, *Sesame*, and *Castor oil* play a crucial role in delivering herbal actives deep into the hair follicles. Modern extraction techniques such as cold pressing, Soxhlet extraction, and ultrasound-assisted extraction are improving the bioavailability and stability of herbal constituents. However, challenges remain in standardization, formulation stability, and clinical testing. With the rising demand for chemical-free and sustainable hair care solutions, herbal hair oils hold vast commercial and therapeutic potential. Future research should focus on integrating advanced technologies like Nano emulsions and green extraction methods to enhance efficacy. Thus, herbal hair oils stand as a viable and sustainable solution for comprehensive hair care in the global wellness industry.

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