

# A Review on Fenugreek Seeds

Harshad Popat Kobarne<sup>1</sup>, Sanika Sunil Zaware<sup>2</sup>, Shubham Vilas Tagad<sup>3</sup>,

Yogita Rajendra Kobarne<sup>4</sup>, Jayashri Subhash Kasar<sup>5</sup>

Students, Mrs. Saraswati Wani College of Pharmacy, Ganegaon, India<sup>1,2,3,4</sup>

Assistant Professor, Mrs. Saraswati Wani College of Pharmacy, Ganegaon, India<sup>5</sup>

**Abstract:** Fenugreek (*Trigonella foenum-graecum*) seeds have been traditionally used in herbal medicine for their therapeutic properties, with increasing interest in their application for promoting hair health. This review paper investigates the scientific basis and potential benefits of fenugreek seeds in herbal hair oil formulations. The seeds contain bioactive compounds, such as saponins, flavonoids, alkaloids, and trace minerals, known to have anti-inflammatory, antioxidant, and antifungal properties (Singh et al., 2020). These compounds contribute to enhanced blood circulation in the scalp, stimulation of hair growth, and the prevention of common hair conditions like dandruff and hair loss (Patel et al., 2019). Studies suggest that fenugreek seeds can strengthen hair follicles, improve scalp health, and help reduce scalp irritation due to their antimicrobial properties (Kumar et al., 2018). Additionally, when combined with other herbal oils like coconut or olive oil, fenugreek has shown synergistic effects that improve hair texture and overall health (Rani & Sharma, 2021). Despite promising results, further research is needed to elucidate the mechanisms through which fenugreek acts on hair follicles and to standardize its use in cosmetic formulations. This review highlights the potential of fenugreek seed-based oils as an effective, natural alternative for hair care, emphasizing the need for continued scientific exploration.

**Keywords:** Fenugreek seeds, herbal hair oil, hair growth, scalp health, dandruff prevention, antimicrobial properties, antioxidant, natural hair care

## I. INTRODUCTION

Fenugreek (*Trigonella foenum-graecum* L.) is an annual diploid species, popularly known as "methi" which belongs to the sub-family "Papilionaceae" from the family "Fabaceae". It is the indigenous culture of the neighboring countries on the eastern shore of the Mediterranean Sea and extended to Central Asia. Fenugreek leaves are an ancient spice used to flavor various foods. The leaves have a bitter taste, but added treat your taste buds to the recipe. In addition to dried leaves, green leaves and the seeds are also often used in cooking. Yellow amber seeds are added making pickles, vegetables and spice mixes like sambar powder. Fenugreek seeds is available in both powdered and powdered form. To reduce them, the seeds are roasted bitterness and enhances the aromatic taste. The herb is also sold as a powder or dried leaves can be bought and in powder form. India is the largest producer of fenugreek in the world, but thanks to a large domestic production consumption does not account for much of the world trade in fenugreek. The harvest was recommended for arid and semi-arid regions of Asia, Africa and Latin America, a plant has been traditionally used in both Indian Ayurvedic medicine and traditional Tibetan medicine and Chinese medicine for several centuries. Modern studies have also proven this Fenugreek seeds and leaves are useful for several ailments, including successfully reduces blood sugar and cholesterol in both animals and humans in experimental trials. Cereal has the potential to act as a miracle drug in the treatment of disease diabetic, microbial and cancer diseases. Therefore, the crop is in high international demand related

### Merits

Promotes Hair Growth: Fenugreek seeds are abundant in iron and protein, essential nutrients that support hair growth. They also contain plant compounds like flavonoids and saponins, which may stimulate hair follicles and enhance hair density.

**HEALTHLINE**

**Reduces Hair Loss:** The seeds possess anti-inflammatory properties that can soothe the scalp and potentially reduce hair fall associated with inflammation and follicle damage.

**EMEDIHEALTH**

**Combats Dandruff:** Fenugreek's antimicrobial properties help fight dandruff and scalp infections, contributing to a healthier scalp environment.

**EMEDIHEALTH**

**Improves Hair Texture:** The mucilaginous content in fenugreek seeds acts as a natural conditioner, adding shine and softness to the hair.

**BE BODYWISE**

**Prevents Premature Greying:** Rich in iron and potassium, fenugreek seeds may help prevent premature greying by supporting the production of melanin, the pigment responsible for hair color.

**AMALA**

**Demerits:-**

**Allergic Reactions:** Individuals allergic to legumes, such as peanuts or chickpeas, may experience allergic reactions to fenugreek, including skin irritation or more severe responses.

**VERY WELL HEALTH**

**Digestive Issues:** Excessive use of fenugreek can lead to digestive problems like diarrhea, bloating, and nausea.

**HAIRMD INDIA**

**Hypoglycemia Risk:** Fenugreek has blood sugar-lowering effects; thus, individuals with diabetes or those on blood sugar-lowering medications should use it cautiously to avoid hypoglycemia.

**VERY WELL HEALTH**

**Hormonal Effects:** Fenugreek contains phytoestrogens, which may interfere with hormonal balance, particularly in pregnant or breastfeeding women.

**VERY WELL HEALTH**

**Etymology:-**

The english name derives via middle french Fenugree from Latin fenugraecum Foenum graecum meaning" Greek hay

**Mechanism:-**

**Enhancing Scalp Circulation**

- **Mechanism:** Fenugreek seeds are rich in saponins and flavonoids, which promote vasodilation and improve blood circulation in the scalp. Enhanced blood flow delivers essential nutrients and oxygen to the hair follicles, stimulating growth and strengthening hair.
- **Effect:** Promotes healthier and faster-growing hair.

**Strengthening Hair Follicles**

- **Mechanism:** The seeds contain proteins and nicotinic acid, which repair damaged hair follicles and provide nourishment. Additionally, lecithin, a natural emollient in fenugreek, coats the hair shaft, reducing breakage and improving resilience.

- **Effect:** Strengthens hair from the root, reducing hair fall.

**Antimicrobial and Antifungal Action**

- **Mechanism:** Alkaloids, particularly trigonelline, along with saponins, exhibit antimicrobial and antifungal properties. These compounds help control scalp infections, such as dandruff and fungal overgrowth.
- **Effect:** Maintains scalp health by preventing irritation and infections.

**Reducing Inflammation and Irritation**

- **Mechanism:** Fenugreek seeds are rich in antioxidants like flavonoids, which reduce oxidative stress and combat inflammation in the scalp. This soothes conditions like itchy scalp and minor scalp wounds.
- **Effect:** Alleviates inflammation and promotes a calm, healthy scalp environment.

**Moisturizing and Conditioning**

- **Mechanism:** Mucilage from fenugreek seeds hydrates and conditions the hair and scalp, acting as a natural moisturizer. This locks in moisture, prevents dryness, and enhances the texture of the hair.
- **Effect:** Improves hair softness, manageability, and shine.

**Promoting Keratin Synthesis**

- **Mechanism:** The high protein content in fenugreek seeds supports the synthesis of keratin, the primary structural component of hair. This promotes thicker, stronger strands.
- **Effect:** Leads to improved hair density and strength

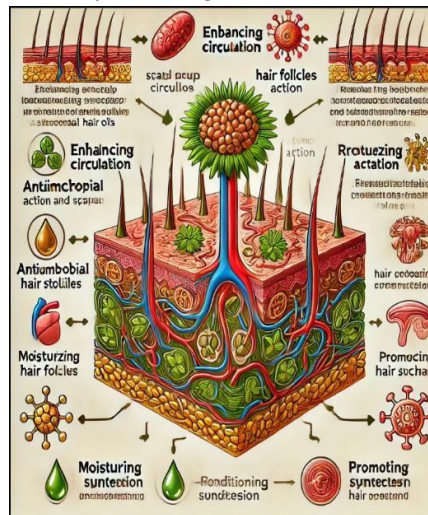


Table 1:-Taxonomical Classification of Fenugreek

Rank	Scientific name and common name
Kingdom	Plantae
Family	Fabaceae
Subfamily	Faboideae
Genus	Trigonella
Order	Fabales
Species	T. Foenum-graecum
Biological name	Trigonella Foenum- graecum
Other names	Fenugreek seed Trigonella
Use	Revives damaged hair. Fights dandruff. Controls scalp inflammation Adds shine and soft texture Prevents premature greying.

TABLE-2 SCIENTIFIC CLASSIFICATION OF FENUGREEK

Kingdom	Plantae
Order	Fabales
Clade	Rosids
Family	Fabaceae
Subfamily	Faboideae
Genus	Trigonella
Species	T.Foenum-graecum



Fig:-Fenugreek Seeds with Chemical Constitution

**Parameters of Fenugreek seed**

Fenugreek seeds (*Trigonella foenum-graecum*) are well-studied for their nutritional, medicinal, and functional properties. Below are key parameters of fenugreek seeds, often discussed in scientific literature:

**Nutritional Composition**

- Carbohydrates: 44–50%
- Protein: 20–25%
- Dietary Fiber: 30–50% (including soluble fiber like galactomannan)
- Lipids: 6–10% (rich in unsaturated fatty acids like linoleic acid)
- Ash Content: ~3%

**Vitamins and Minerals**

Vitamins: Vitamin A, B-complex (B1, B2, B3, B6), and C  
Minerals: Iron, calcium, magnesium, potassium, and zinc

**Phytochemical Composition**

Saponins: Diosgenin (precursor for steroidal drugs)  
Alkaloids: Trigonelline  
Flavonoids: Vitexin, isovitexin  
Polyphenols: Antioxidant properties  
Glycosides: Responsible for hypoglycemic effects

**Functional Properties**

Antioxidant: Reduces oxidative stress Hypoglycemic: Manages blood sugar levels Hypolipidemic: Reduces cholesterol levels

Anti-inflammatory: Provides relief in inflammation-related conditions Digestive Benefits: Aids digestion and relieves constipation

**Physical Parameters**

Seed Size: ~3–5 mm

Color: Yellowish-brown or amber

Density: ~0.65–0.75 g/cm<sup>3</sup>

Moisture Content: Typically <10% in dried seeds

**Medicinal Applications**

Diabetes Management: Improves insulin sensitivity and glycemic control

Hormonal Effects: Enhances lactation and improves menstrual health Appetite Control: Aids in weight management

**Industrial Uses**

Food Industry: Used as a thickener, flavor enhancer, or emulsifier

Pharmaceuticals: Incorporated in supplements and herbal medicines

Cosmetics: Used in skin and hair care products

**II. CONCLUSION**

Fenugreek seeds hold significant promise as a key ingredient in herbal hair oil formulations due to their rich composition of bioactive compounds, including saponins, flavonoids, and alkaloids. These compounds contribute to improved scalp health, strengthened hair follicles, and the prevention of common issues such as dandruff and hair loss. The synergistic effects of fenugreek when combined with other carrier oils further enhance its potential for promoting hair growth and improving hair texture. While the existing evidence underscores its efficacy as a natural and cost-effective solution for hair care, further research is essential to standardize its use, understand its mechanisms, and validate its long-term benefits in cosmetic applications. Fenugreek seed-based hair oils offer a sustainable and natural alternative for those seeking to enhance their hair health through herbal remedies.

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