

Fenugreek (*Trigonella foenum-graecum*): A Versatile Herb with Nutritional and Medicinal Significance

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Abstract— *Trigonella foenum-graecum* (Fenugreek) is a well-known medicinal and culinary herb belonging to the Fabaceae family. It has been used since ancient times, particularly in Greek, Egyptian, and Indian medicine, for its numerous health benefits. Fenugreek seeds and leaves contain bioactive compounds such as saponins, alkaloids, flavonoids, and fibre, which contribute to its medicinal properties. Traditionally, it has been used to aid digestion, enhance metabolism, promote lactation, and manage diabetes. Recent scientific studies have confirmed its antioxidant, anti-inflammatory, hypoglycaemic, and lipid-lowering effects, highlighting its significance in modern medicine. Additionally, fenugreek has applications in weight management, reproductive health, and cardiovascular wellness. Despite its vast benefits, proper dosage and potential allergic reactions should be considered before consumption. This review explores the historical significance, phytochemistry, and pharmacological potential of *Trigonella foenum-graecum*, demonstrating its role as a bridge between traditional wisdom and modern science.

Index Terms— *Trigonella foenum-graecum*, Fenugreek, Methi, traditional medicine, therapeutic benefits

I. INTRODUCTION

Fenugreek (*Trigonella foenum-graecum* Linn.) is a leguminous plant widely cultivated for its medicinal, culinary, and nutritional value. It belongs to the family Leguminosae, the second largest family of flowering plants which contains 400 genera and 10000 species.¹ The name *Trigonella* is derived from the Greek word meaning "triangle," while *foenum-graecum* translates

to "Greek hay," indicating its historical use as livestock fodder in ancient Greece. The plant has a long-standing history in traditional medicine, where it was used for its digestive, anti-inflammatory, and metabolic benefits.²⁻³ The leaves and seeds of plant have been used extensively as a remedy for various ailments, including labor induction, respiratory conditions, and gastrointestinal disorders.⁴ Fenugreek seeds and leaves are rich in bioactive compounds such as saponins, alkaloids, flavonoids, and fiber, contributing to their therapeutic potential.²⁻⁶ Fenugreek is known for its ability to stimulate lactation in nursing mothers, making it a popular herbal remedy for postpartum care. Its distinct aroma and slightly bitter taste make it a key ingredient in various cuisines, enhancing the flavour of dishes while offering health benefits.⁷⁻⁸ Modern scientific research has validated its antioxidant, hypoglycaemic, hypolipidemic, and anti-inflammatory effects, making it a promising herb for metabolic disorders. The presence of diosgenin, a steroidal saponin, also suggests its potential role in hormone regulation and reproductive health.^{2-6,9}

II. MATERIAL AND METHOD

A comprehensive literature search on Fenugreek was conducted to gather relevant information on its traditional uses, pharmacological activities, and phytochemical properties. Classical Unani texts, including the Urdu translations of *Al-Qanun fi'l-Tibb*, *Al-Hawi*, *Kitab al-Mukhtar*, etc were carefully reviewed. Published research articles from peer-

reviewed journals were identified using scientific databases such as PubMed, Google Scholar, ScienceDirect, and Scopus. Relevant review articles,

pharmacological studies, and phytochemical reports about Fenugreek were included to ensure a thorough evaluation of existing knowledge.

Botanical Name: *Trigonella foenum graecum*, Linn.^{2,5,8-9}

Synonyms: Methi dana,⁷ Greek Hay Seed, Bird's Foot.⁵



(a)



(b)

Fig.: *Trigonella foenum graecum* L. (a) Leaves, (b) Seeds

III. RESULTS

Trigonella foenum-graecum Linn. ^(2,5,8-9), commonly known as fenugreek, belongs to the family Fabaceae (Leguminosae) ^(2-3,9-10) under the subfamily Papilionaceae ^(2-3,8-9). The plant is classified taxonomically under the kingdom Plantae and the order Rosaceae, with *Trigonella* L. ⁽²⁻³⁾ as the genus and *foenum-graecum* ⁽²⁾ as the species. The plant is also known by several synonyms, including Methi dana ⁽⁷⁾, Greek hay seed, and Bird's Foot ⁽⁵⁾.

Fenugreek is widely recognized across different traditional systems of medicine and languages. It is commonly referred to as Methi ⁽¹¹⁾. In the Unani system, it is known as Teelas, Sheelan, Taalas, Talas, and Fariqa ^(6,12). The Arabic names include Hūlbah ^(8,9), Shamleet ^(6,12), Fariqa, Qaran-us-soor, and Qaran-ul-Unz ⁽⁶⁾. In Persian, the plant is referred to as Samleet ⁽¹³⁾ and Shanbelileh ⁽²⁾. Hindi vernacular names include Methi ^(8,6,12), Meti, and Mutti ⁽⁹⁻¹⁰⁾, while in English it is known as Fenugreek ^(6,8-10). Sanskrit literature records several names such as Medhika ⁽⁸⁾, Methi, Bahuparni, Misrapushpa, Methini ⁽⁹⁾ and Kalanusari ⁽¹⁰⁾. In Kannada, the plant is known as Mentya, Mente, and Mentessoppa ⁽¹⁰⁾.

The present compilation reveals that *Trigonella foenum-graecum* (Hūlba) is extensively described in Unani literature with well-defined concepts of Mahiyat (nature), Mizāj (temperament), therapeutic actions, and clinical applications. According to classical descriptions, Hūlba is a common plant bearing small, yellowish, mucilaginous seeds with a bitter taste. The branches are thin and approximately one foot long, while the leaves are small, pyramidal, blackish-brown, bitter in taste, and possess a characteristic odour. The lower portion of the plant is narrower than the upper part, and the plant parts are traditionally used as food ⁽¹²⁻¹³⁾. Seeds, pods, and leaves are the principal medicinally used parts ⁽⁸⁾.

The temperament (Mizāj) of Hūlba has been variably reported as Hot-3° and Dry-3° ⁽⁷⁾, Hot-2° and Dry-2° ^(7-8,15-16), and Hot-2° and Dry-1° ^(6,12,17). The recommended dose (Miqdāre Khurāk) ranges from 3–10 g ^(2,7,12,13), while for enema (Huqna) doses of 60–70 g have been documented ^(7,12). Despite its wide therapeutic use, adverse effects (Muzir) such as hepatotoxicity ⁽¹³⁾, testicular harm ^(7,12,16), headache, nausea ^(12,15), and aggravation in individuals with hot temperament ⁽⁷⁾ have been reported. Various correctives (Muşliḥ) including Palak, Tukhm Khurfa Siyah, Sirka, Tursh Sikanjabin, Anisūn, Anar

Maikhoosh, Sharabe Reehani, Roghan Badam Talkh, Āb Kama, and other cold items are prescribed to mitigate these effects ^(7,12,13,16).

Unani literature reports extensive pharmacological actions (Af'āl) of Ḥulba such as Mudirr-i-Ḥayḍ (emmenagogue), Mudirr-i-Bawl (diuretic) ^(7,12-16), Mulattif (demulcent) ⁽¹²⁻¹³⁾, Kasir-i-Riyāḥ (carminative), Muqawwi (tonic), Munaffith-i-Balgham (expectorant), Muqawwi-i-Bah (aphrodisiac), Muhallil (resolvent), Jālī (detergent), Musakhkhin (calorific), and Musakkin (analgesic) ^(6,7,12-17). Therapeutically, Ḥulba is employed in amenorrhoea, diabetes, gout, anaemia, dyspepsia, diarrhoea, cough, asthma, dropsy, hepatic and splenic enlargement, arthritis, dysentery, urinary incontinence, piles, melasma, puerperal disorders, and lactation enhancement ⁽⁶⁻¹⁵⁾.

Ethnobotanical evaluation confirms that fenugreek is an erect annual herb reaching up to 50 cm in height with trifoliate leaves, axillary pale yellow to purplish flowers, curved pods, and hard, aromatic, bitter seeds ^(2-5,9). The plant is indigenous to the Mediterranean and North Africa and is widely cultivated across Asia, Europe, Australia, and the Americas ^(2-3,5).

Phytochemical investigations reveal the presence of flavonoids, steroidal saponins, alkaloids, mucilage, and fibres. Major flavonoids include orientin, isoorientin, vitexin, apigenin, and quercetin ^(2,5). Steroidal saponins such as diosgenin, yamogenin, tigogenin, gitogenin, sarsapogenin, and smilagenin are predominant ^(2,5,6-12). Alkaloids like trigonelline and choline ^(2,5,8,9) along with aromatic constituents have also been identified ^(2-3,5).

Pharmacological investigations have provided substantial experimental evidence supporting the traditional therapeutic claims of *Trigonella foenum-graecum*. Xue et al. demonstrated the hypoglycaemic activity of fenugreek seed extract in streptozotocin-induced diabetic rats, where treatment resulted in a marked reduction in blood glucose levels compared to animals receiving streptozotocin alone, along with improvement in body weight gain, indicating a protective metabolic effect ⁽²⁰⁾. The antioxidant potential of fenugreek was evaluated by Kaviarasan et al., who reported that the methanolic extract of fenugreek seeds effectively quenched free radicals in rat liver tissue, suggesting its role in mitigating oxidative stress-mediated cellular damage ⁽²¹⁾. In another experimental study, the ethanolic extract of

fenugreek seeds exhibited significant antineoplastic activity against Ehrlich Ascites Carcinoma in mice following intraperitoneal administration, leading to a notable alteration in the number and growth pattern of ascitic cells and a significant inhibition of tumor progression ⁽²²⁾. Hypolipidemic activity has also been substantiated, as fenugreek seed powder produced a significant reduction in lipid levels in rabbits with experimentally induced hyperlipidemia, indicating its potential in the management of dyslipidemic conditions ⁽²³⁾. Furthermore, clinical evaluation of fenugreek seed extract in healthy overweight male participants revealed a reduction in the fat energy intake to total energy expenditure ratio, accompanied by a decrease in the insulin-glucose ratio, thereby highlighting its anti-obesity and metabolic regulatory effects ⁽²⁴⁾. Additionally, Sreeja et al. provided in vitro evidence of estrogenic activity of the chloroform extract of fenugreek seeds, which supports its traditional use in female reproductive disorders and lactation-related conditions ⁽²⁵⁾.

IV. DISCUSSION

The findings strongly support the classical Unani claims regarding the multifaceted therapeutic value of Ḥulba. The mucilaginous nature and hot-dry temperament correlate well with its demulcent, resolvent, expectorant, and carminative actions described in Unani texts ⁽⁶⁻¹⁷⁾. The extensive use of fenugreek in metabolic disorders such as diabetes and obesity in Unani medicine is substantiated by modern pharmacological studies demonstrating hypoglycaemic ⁽²⁰⁾, hypolipidemic ⁽²³⁾, and anti-obesity effects ⁽²⁴⁾. The presence of steroidal saponins, particularly diosgenin, provides a scientific basis for its aphrodisiac, estrogenic, galactagogue, and uterotonic actions ⁽²⁵⁾.

Unani scholars such as Ibn Sina, Razi, Ibn Masoia, and Rabban Tabri have emphasized its role in reproductive health, respiratory nourishment, dermatological applications, and detoxification processes ^(6,12,15). The reported ability of Ḥulba to impart foul odour to urine and sweat while improving stool odour ^(7,12,15) reflects its systemic metabolic influence, which may be linked to its aromatic and volatile constituents.

Ethnomedicinal uses across India, China, Egypt, and Rome further highlight its global acceptance as a

nutritive, lactogenic, and restorative agent. Its substitution for cod-liver oil in classical medicine ⁽⁸⁾ underscores its nutritional and tonic significance, particularly in chronic debilitating conditions.

V. CONCLUSION

Trigonella foenum-graecum (Hulba) emerges as a highly valued medicinal plant with profound therapeutic relevance in Unani medicine, supported by ethnobotanical knowledge and contemporary pharmacological evidence. Classical descriptions of its temperament, actions, indications, and formulations are strongly corroborated by modern studies revealing hypoglycaemic, hypolipidemic, antioxidant, anticancer, estrogenic, and anti-obesity activities. The rich phytochemical profile, especially steroidal saponins and flavonoids, provides a scientific rationale for its wide-ranging clinical applications. Fenugreek thus represents a promising candidate for integrative medicine and further clinical research aimed at validating traditional claims and developing standardized herbal therapeutics.

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VII. DECLARATION OF COMPETING INTERESTS

The authors declare there is no conflict of interest.

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