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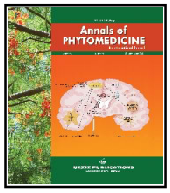

Review Article : Open Access

Study on functional properties and health importance of Fenugreek (*Trigonella frenum-graecum* L.): A review

Neel Patel◆, Sury Pratap Singh and Vedika Thakur
Department of Food Technology, Parul University, Vadodara-390001, Gujarat, India

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Abstract

Fenugreek is a well-known species that is used as food supplement to enrich colour, flavour and texture. The plant contains bioactive components like alkaloids, flavonoids, steroids, saponins, *etc*. Since ancient times, fenugreek is widely used in food as well as it is known for its medicinal properties due to presence of alkaloids, steroid compounds. It is renowned for having medical benefits including antidiabetic, anti-carcinogenic, hypocholesterolaemia, antioxidant, and immunological activity. Fenugreek seeds are rich in fibre, phospholipids, glycolipids, oleic, linolenic, linoleic acids, choline, vitamins A, B1, B2, C, nicotinic acid, and niacin. The dietary fiber of fenugreek is about 25%. Recent studies have shown that fenugreek is an important medicinal plant with the ability to treat ailments as well as a source for manufacturing the basic ingredients used in the pharmaceutical sector, such as steroidal hormones. Fenugreek can be used as a food stabiliser, binder, and emulsifying agent to alter the texture of food for some specific uses because of its high fibre content. Fenugreek has bioactive compounds such as tryptophan, lysine, arginine, folic acid. This review article contains information about fenugreek's components, biological activity, nutritional qualities, health, medicinal benefits and its uses in the creation of diverse food products.

1. Introduction

Fenugreek (*Trigonella Foenum-groecum* L.) is an annual plant native to the eastern banks of the Mediterranean that is widely cultivated in India, Egypt, and Morocco (Snehlata and Payal, 2012). The term "fenugreek" is derived from the Latin term foenum-graecum, which refers to "Greek hay," since this plant often was employed to smell inferior hay (Flammang *et al*., 2004).Trigonella is a genus whose name derives from an old Greek word that indicates "three-angled," probably related to the triangular shape of the blossoms (Snehlata and Payal, 2012).The first documented usage of fenugreek dates back to 1500 B.C. and is detailed on an ancient Egyptian papyrus. Fenugreek seed is often used in cuisine (Dwyer *et al*., 2017). Fenugreek leaves, seeds, and oil have the ability to treat a wide range of diseases or conditions, including arthritis, gout, epilepsy, piles, persistent cough, bronchitis, and gastric ulcers. According to some studies, fenugreek seeds have antioxidant, anti-inflammatory, antipyretic, and antitumor properties, antibacterial and antidiabetic properties (Sahar *et al*., 2021). Fenugreek has a distinctive flavour and scent. The plant's leaves and seeds are extensively used as a spice in food preparations and as a component in traditional medicine in the Indo-Pak subcontinent and other eastern nations (Syeda *et al*., 2008). In ancient times, fenugreek was used for a variety of purposes. It was used to cure wounds, abscesses, arthritis, pneumonia, ulcers, and digestive disorders. It was traditionally used by Chinese herbalists to treat renal disorders and illnesses affecting the male reproductive tract. Fenugreek was and still is a popular meal and spice in many regions of the world (Snehlata and Payal, 2012). Spices are natural food additives that have been used to improve the sensory quality of foods for thousands of years. Spices give meals their distinct flavour, fragrance, picquancy, and colour. Some spices, such as fenugreek, can also change the texture of food. Fenugreek is a leguminous plant that is grown in India and North Africa. It is a member of the Fabaceae family and is known by many different names in many languages, including Fenugrec (French), Methi (Hindi), Bockshorklee (German), Fienogreco (Italian), Pazhitnik (Russian), Alholva (Spanish), Koroha (Japanese), Hulba (Arabian), Halba (Malaya), and K'u-Tou (China). The seeds are used as spices all throughout the world, while the leaves are eaten as green leafy vegetables. Fenugreek seeds have a bitter flavour and have long been renowned for their therapeutic properties. Fenugreek seeds have been in use for over 2500 years. India is the largest producer and user of fenugreek for culinary and medical purposes. Fenugreek seeds are used as a seasoning, flavouring ingredient, and in relatively higher quantities in soups and pan cakes. It is used to treat anorexia and is a stomach stimulant in Indian traditional medicine (Chopra *et al*., 1986; Fillips and Foy 1990).

Fenugreek is a well-known spice in human cuisine. The seeds and green leaves of fenugreek are utilised in both food and medicine, as has been done since the dawn of time. Fenugreek seeds have anticancer, hypocholesterolemic, lactation aid, antimicrobial,

Corresponding author: Mr. Neel Patel
Department of Food Technology, Parul University, Vadodara-390001, Gujarat, India
E-mail: neel8012@gmail.com
Tel.: +91-6359766513

stomach stimulant, anorexia, antidiabetic agent, galactogogue, hepatoprotective action, and anticancer characteristics. These favourable physiological benefits of fenugreek, which include anti-diabetic and hypocholesterolemic effects, are mostly due to the intrinsic dietary fibre content, which has promise nutraceutical value (Srinivasan, 2006). It is well recognised for the fibre, gum, various chemical ingredients, and volatile elements it contains. Fenugreek seed has roughly 25% dietary fibre, which affects the texture of meals. Because of its high fibre, protein, and gum content, it is now utilised as a food sabiliser, glue, and emulsifying agent. Fenugreek protein is reported to be more soluble at alkaline pH (Meghwal and Goswami, 2012). Fenugreek has a favourable effect on digestion and the capacity to adapt meals. The carbonised fenugreek seed was discovered in Rohilla village in the Sangrur area of Punjab, India, demonstrating its use and commerce as far back as 2000-1700 BC (Saraswat, 1984). The pharmacological activity of fenugreek seeds is ascribed to bioactive chemicals that are used as raw materials in the production of many therapeutic and hormonal medications (Mahmood and Yahya, 2017).

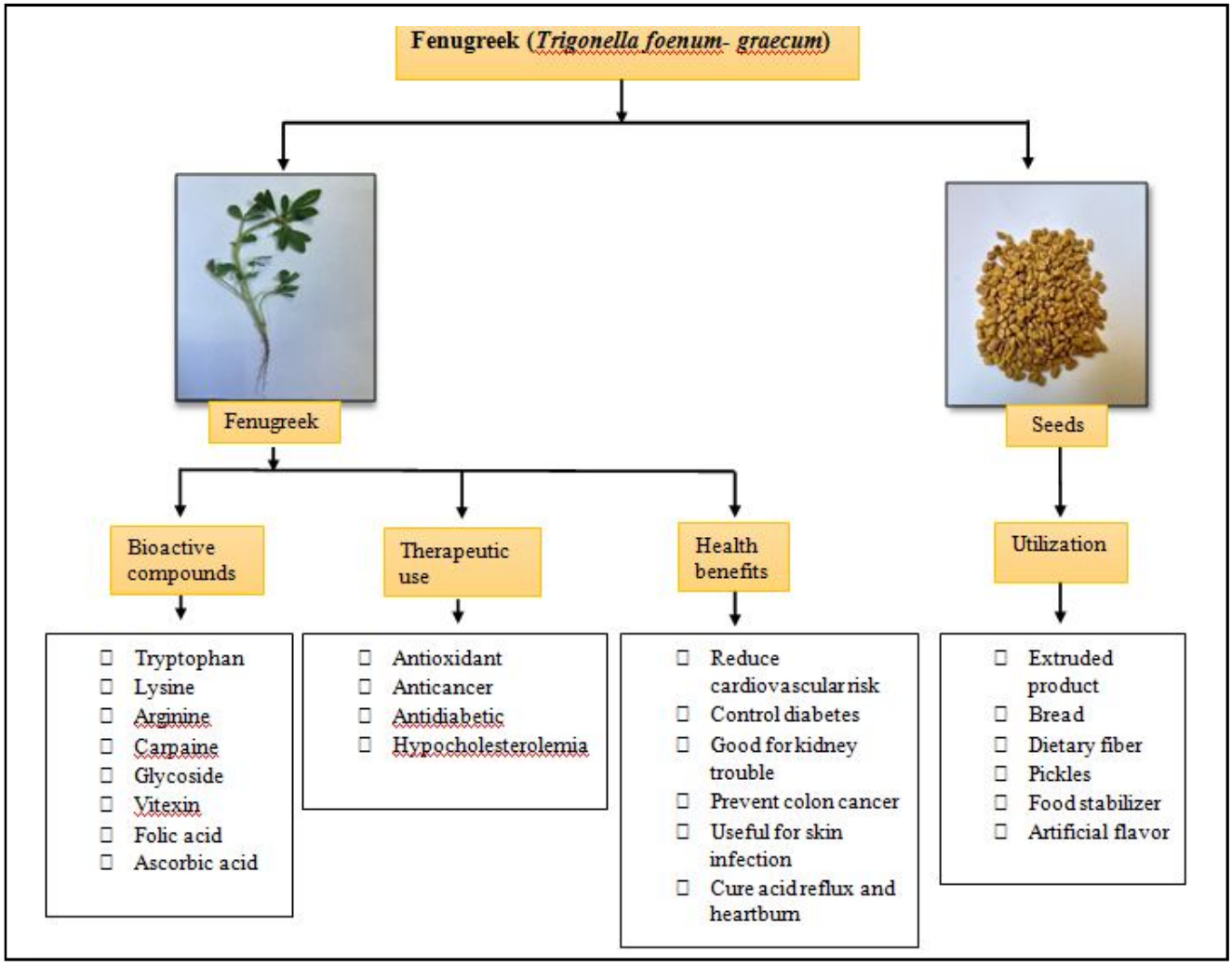

Figure 1: Future application of different parts of fenugreek (*Trigonella frenum-graecum* L.).

1.1 Fenugreek plant

Fenugreek is a diploid annual legume plant with no aneuploidy (Ahmad *et al*., 1999; Petropoulos *et al*., 2002; Flammang *et al*., 2004). The Fabaceae family, the Leguminosae family, or the Papilionaceae subfamily includes the annual dicotyledonous plant called as fenugreek. Southern Europe, Asia, and the Mediterranean are its native regions (Snehlata and Payal, 2012). This plant might contain about 260 species, with 18 currently recognised (Acharya *et al*., 2006). Fenugreek germinates within 5 to 10 days, and approximately five to eight days after germination, the first trifoliate leaf develops. The plant grows quickly and may thrive in dried grasslands, cultivated or uncultivated fields, hills, plains, and field boundaries, though it needs a lot of sunlight. For 4 to 7 months, fenugreek must mature (Mehrafarin *et al*., 2011; Montgomery, 2009; Petropoulos, 2003). Many strong and potent drugs are derived from plants, which are used for therapeutic applications in many different countries. This herb reduces body fat and is useful against obesity. The fenugreek plant, which is extensively dispersed around the world. Through proper cultivation, irrigation, and harvesting management, yields may be significantly increased in both quantity

and quality. Across this regard, fenugreek, an annual herb, is produced extensively for its therapeutic benefits in the majority of the world (Petropoulos, 2002).

1.2 Stem

The stems of fenugreek are upright, hollow, and round to slightly quadrangular. Due to anthocyanin buildup, the stems are deep green or deep bluish-green. Fenugreek stems are categorized into two types: monostalks with no supplementary shoots as well as multistalks with several shoots emerging from the basal and higher nodes (Petropoulos, 2002). Fenugreek includes a number of sapogenins that are steroidal.The oily embryo contained the diosgenin, which was found. Hederaginglycosides and 2 furastanol glycosides, which open the F-ring of diosgenin, have both been described. Alkaloids discovered in stem comprise of trigonelline, trigocoumarin, trimethyl coumarin, and nicotinic acid. Mucilage is an important component of seed (Snehlata and Payal, 2012).

1.3 Flower

In fenugreek, there are two types of blooming branches. The most common kind develops indeterminately and generates axillary flowers; on rare instances, "blind shoots" appear and generate both axillary as well as terminal flowers bearing seeds at the tip (Petropoulos, 2002).The whole, papilionaceous, and triangle fenugreek blossoms are shaped. The name "Trigonella" is based on the Latin word which means "small triangle" because of the triangular form of the blooms (Rosengarten, 1969). Fenugreek comprises two kinds of flowers: cleistogamous blooms and cleistogamous blooms. The most of fenugreek flowers are typically cleistogamous, with the base staying closed to promote selfpollination. Less than 1% of a plant's blooms are aneictogamous, and because parts of the corolla stay open, they can be cross-pollinated (Petropoulos, 2002).

1.4 Leaves and roots

Fenugreek has simple, petiolate leaves with 3 leaflets. Fenugreek leaflets are greenish, oval to orbicular in shape, and have some denting on the edges. The plant's leaves are arranged alternately throughout (Slinkard *et al*., 2006). The root system of the fenugreek plant comprises of a tap root as well as branching lateral roots which arise from the main root (Acharya *et al*., 2006).

1.5 Fruit and seeds

The pod is the fenugreek fruit structure. Fenugreek pods are tall, upright, pointy, sickle-shaped, and thin. They have a pointed beak that is 2 to 3 mm long at the end (Duke, 1981). Fenugreek seeds are golden-yellow in colour; however, some species can yield mature seeds which are yellow-green in colour (McCormick *et al*., 2009). The seeds have grooves between the radicle and the cotyledons and are rhomboidal in shape, as well as rectangular, square, or asymmetrical (Slinkard *et al*., 2006).The seed coat covers the seeds of fenugreek and it segregates from the embryo by just a black, transparent endosperm (Fazli and Hardman, 1968).The aleurone layer is a mono- layer of living tissue that exists between both the pericarp and even the endosperm. The bulk of the cytoplasm in mature seeds is constituted of 'galactomannan' store reserves (Petropoulos, 2002).

2. Nutritional content of fenugreek

Fenugreek is used in curry as well as a flavor (Rakesh *et al*., 2012). Fenugreek contains a variety of functionalised chemicals as well as nutrients that are necessary for the well-being and function of biological systems. The seeds possess 58.00% carbohydrates, 22 to 26.0% proteins, 0.90% fats and 25.0% fibre. Fenugreek leaves contain 6.0%, 4.40%, 1.10%, and equivalent quantities of carbs, proteins and fibre (Wani, 2018). In addition, fenugreek has various mineral contents, including potassium (603 mg/100 g), magnesium (42 mg/100 g), calcium (75 mg/100 g), zinc (2.4 mg/100 g), manganese and copper (0.9 mg/100 g), and iron (25.8 mg/100 g). Carotene (19 mg/100 g) and vitamin C (220 mg/100 g) are also regarded as essential components of fenugreek (Wani, 2018; Al-Jasass and Al-Jasser, 2012). Fenugreek consists of a variety of important amino acids, including aspartic acid, glutamic acid, leucine, tyrosine, and phenylalanine. Fenugreek also possess trace amounts of methionine and cysteine, two sulfur-containing amino acids with important physiological functions in the body. In fenugreek (2S, 3R, 4S)-4-hydroxyisoleusine is the most prevalent amino acid present in free form.The non-protein amino acid 4-hydroxyisoleucine makes up around 80.0% of the amino acid content of dried seeds, and throughout its growth phase, it multiplies rapidly. Studies show that the fenugreek's proteins are of higher quality than those found in other plants. Feyzi and his colleagues conducted a research to evaluate the protein quality of fenugreek seeds to soy protein isolate. They discovered that when compared to soy protein isolate, the seeds contain greater protein content and a superior amino acid profile (Feyzi *et al*., 2015). Fenugreek proteins also included a lot of aspartic and glutamic acids. The results also showed that fenugreek proteins are more stable, have higher solubility and stability than soy proteins, and have higher denaturation temperatures than soy proteins. As a result, they can be used as a reliable source of protein in a variety of functional meals. Fenugreek also contains sotolone, an essential functional phytochemical utilised as a dressing flavour (Nagulapalli *et al*., 2017).The quantity of alkaloids in fenugreek is significant (trigonella, trigocoumarin, nicotinic acid and trimethyl coumarin). It also includes vital, useful components such as flavonoids and polyphenols. Flavonoids found in fenugreek alcoholic extracts include quercetin, luteolin, vitexin, and 7, 4-dimethoxy flavanones. Other groups have observed similar results regarding the presence of aglycones, kaempferol, quercetin, tricin, and naringenin (Petropoulos, 2002). The chemicals were isolated from particular fenugreek plant sections as well as from stem, leaf, and flower extracts and hydrolysates.The bulk of the flavonoids in fenugreek are present as glycosides, which are complex due to their C- and O-glycosidic bonding with carbs. This information was revealed by the phytochemical analysis of the plant. In fenugreek, rare flavonol glycosides such quercetin-3-O-rhamnoside (quercitrin), vitexin-7-Oglucoside (afroside), and apigenin-6-C-glucoside may be detected (isovitexin) (Rayyan *et al*., 2010). Apigenin-6-C-glucoside (isovitexin) and apigenin-8-C-glucoside (vitexin) were present in seeds. There have also been reports of the presence of isoflavonoid phytoalexin aglycones in this herb, including medicarpan and maackiaian.These are referred to as "induced isoflavoniods," and their production may be influenced by outside causes like microbial activity (Nagulapalli *et al*., 2017).

2.1 Protein

Protein content in fenugreek endosperm is high which includes lecithin, globulin and albumin (Mathur and Choudhry, 2009; Naidu *et al*., 2011). It contains significant amount of amino acids in free form (20.0-30.0%), especially 4-hydroxyisoleucine and histidine, that may increase the action of the hormone insulin (Isikli and Karababa, 2005). It also possesses protein that is sufficiently stable and is not afflicted by booking (Srinivasan, 2006). The seeds of fenugreek that have been debitterized are also rich in protein and lysine.

2.2 Fat

Fenugreek seeds have a total lipid content of 5.5-7.5%, with neutral lipids making up the majority (85%), followed by phospholipids (10%) and glycolipids (5%), oleic (14%), linolenic (25%), and linoleic (40%) acids are unsaturated lipids (Sulieman *et al*., 2000; Chatterjee *et al*., 2010). Fenugreek possesses analgesic and appetite-stimulating properties due to N-acylethanolamines (NAEs) and oleamide (Kaviarasan *et al*., 2007).

Table 1: Concentration of lipid in fenugreek seeds

Identification of lipids	Amount (g/100 g)
Monoacylglycerols	0.180 ± 00.005
Diacylglycerols	0.2800 ± 0.0080
Triacylglycerols	4.330 ± 0.011
Phosphotidylcholine	0.1100 ± 0.0020
Phosphotidylinositol	0.0090 ± 0.001
Phosphotidylethanolamine	0.036 ± 0.003
Free fatty acids	0.1600 ± 0.0010

Source: Chatterjee *et al.* (2010).

2.3 Vitamins and minerals

Seed of fenugreek contains significant number of the vitamins; namely, choline, nicotinic acid, vitamin A, B_1, B_2, C and niacin. Germination seeds include biotin, calcium pantothenate, pyridoxine, vitamin C, and cyanocobalamine. Moreover, radiation subjection significantly lowers its vitamin contents (Leela and Shafeekh, 2008). Vitamins are there present in its leaves, although 7-11% of them may be lost when they are boiled, steam-cooked, or fried. There is a fair amount of calcium, phosphorus, and sulphur in fenugreek seeds (El Nasri and El Tinay, 2007; Jani *et al*., 2009).

Table 2: Fenugreek vitamin composition and concentrations

Particulars	Plant part	Value/100 g
Vitamin A,	Seed	60-100 IU
Vitamin A, RAE	Seed	3.0 µg-RAE
Vitamin B_1	Seed	0.41 mg
Vitamin B_2	Seed	0.36 mg
Vitamin B_6	Seed	0.600 mg
Ascorbic acid	Seeds	12.0-43.0 mg
Vitamin C	Leaf	52.00 mg
β-carotene	Seeds	96.0 mg
β-carotene	Leaves	2.3 mg
Riboflavin	Seeds	290 mg
Riboflavin	Leaves	310 mg
Folic acid	Seed	84 mg
Thiamine	Seed	340 mg
Thiamine	Leaves	40 mg
Nicotinic acid	Seed	1.1 mg
Nicotinic acid	Leaves	800 mg
Niacin	Seed	6.0 mg

Source: Leela and Shafeekh (2008); USDA (2011); Srinivasan (2006).

Table 3: Mineral content of fenugreek seeds (mg/100 g)

Mineral content	mg/100 g of fenugreek seed extract
Magnesium	42 ± 5
Calcium	75 ± 9
Potassium	603 ± 15
Zinc	2.4 ± 0.2
Iron	25.8 ± 1.2
Cupper	0.9 ± 0.1
Manganese	0.90 ± 0.10

Source: Jasass and Jasser (2012).

3. Biologically active compounds

Strong antioxidant capabilities of fenugreek are associated to its health benefits. Surprisingly, germination improves the benefits of seeds over dry, non-germinated seeds in this case. However, compared to flavonoids and phenolics, the aqueous fraction of fenugreek has more antioxidant activity (Balch, 2003; Meghwal and Goswami, 2012; Khole *et al*., 2014). Fenugreek has substantial quantity of flavonoids, saponins alkaloids and other antioxidant. In terms of mg per 100 g of the seed extract, it contains a significant class of phenolics, including gallic acid (1.7), protocatechuic acid (4.0), catechin (0.4), gentisic acid (35.8), chlorogenic acid (0.7), vanillic acid (58.5), and syringic acid (0.3) (Rababah *et al*., 2011). Trigonelline the most vital alkaloid, which is found in 35% of fenugreek endosperm (Jani *et al*., 2009). More than 100 mg/g of flavonoid are present in its seed (Naidu *et al*., 2011). As a result of their alleviative outcome on the humans after ingestion, all of these chemicals are categorised as bioactive. Due to their hypoglycemic, anticarcinogenic, antilipidemic and cholagogic properties, their use in the diet should be encouraged in order to manage diabetes mellitus, cancer, and high cholesterol (Meghwal and Goswami, 2012). The two main components that produce a bad odour and a bitter taste, however, are volatile oils and alkaloids, which can be removed.

Table 4: Biologically active compounds

Chemical group	Compounds	References
Amino acids	Tryptophan, tyrosine, lysine, histidine, 4-hydroxyisoleucine, cystine, and arginine	Gupta *et al.* (2001) Ruby *et al.* (2005) El Nasri and El Tinay (2007)
Alkaloids	Choline, trigonelline, and Carpaine	Lee *et al.* (2005) Kaviarasan *et al.* (2007) Rababah *et al.* (2011)
Saponin	Fenugrin, foenugracin, glycoside, yamogenin, trigonoesides, smilagenin, gitogenin, sarsasapogenin, yuccagenin, hederagin, diosgenin, tigonenin, and neotigogenin	Gupta *et al.* (2001)
Flavonoid	Naringenin, lilyn, kaempferol, tricin 7-O-D glucopyranoside, vecenin-1, saponaretin, isovitexin, and isoorientin. luteolin, quercetin, orientin, vitexin, and vitexin	Blumenthal *et al.* (2000) Sauvare *et al.* (2000) Meghwal and Goswami (2012)
Coumarins	Methyl coumarin, trigocumarin, trimethyl coumarins	Raju *et al.* (2001)
Others	Retinol, folic acid, vitamin-C, vitamin-B1, vitamin-b2, biotin, niacin.	Hamden *et al.* (2010) Chatterjee *et al.* (2010)

4. Medicinal uses

The therapeutic powers of fenugreek seeds have long been acknowledged. Microbiological investigations have demonstrated that fenugreek extracts exhibit antibacterial effect against a range of microorganisms (Aqil and Ahmad, 2003; Wagh *et al.*, 2007). When extracted in water, the seeds, roots and shoots of fenugreek can combat fungus (Haouala *et al.*, 2008). Fenugreek seed compositions are used to treat digestive problems. Colon cancer is prevented and the mucosa of ulcer disease is treated by aqueous solutions as well as macerated fenugreek oils (Pandian *et al.*, 2002; Raju *et al.*, 2004). Similar to silymarin, fenugreek exhibits hepatoprotective activity (Kaviarasan *et al.*, 2008, Pribac *et al.*, 2009). In Iran, gynaecological problems and eye infections are healed using fenugreek leaves (Miraldi *et al.*, 2001; Bashtian *et al.*, 2013). Trigonelline, a neuroprotective alkaloid discovered in fenugreek seeds, is helpful in treating and preventing neurological illnesses (Tohda *et al.*, 2005). Fenugreek seeds also possess analgesic, antiinflammatory and antipyretic properties (Malviya *et al.*, 2010). It has been discovered that fenugreek extracts, which include active ingredients of hypoglycemic effects including coumarin, trigonelline and nicotinic acid, actively limit the growth of breast cancer. Fenugreek's anticarcinogenic properties will potentially be significantly influenced by flavonoids (Abdel-Nabey and Damir, 1990; Amin *et al.*, 2005). The anticarcinogenic effects of fenugreek may be significantly influenced by flavonoids. Fenugreek is a valuable raw resource for the pharmaceutical sector, which has spent years researching for cancer therapies that are effective. Fenugreek extracts possess estrogenic features that make them useful for erectile dysfunction treatment and reducing menopausal symptoms. Pharmaceutical companies are becoming increasingly involved in fenugreek research due to the presence of diosgenin in the species being researched. Diosgenin may be used to generate oral steroids as well as hormones, while it also significantly lowers cholesterol levels (Oncina *et al.*, 2000). Extracts from fenugreek seeds reduce blood sugar levels (Bashtian *et al.*, 2013). Fenugreek is utilized to create tinctures, meads, antidepressant and psychotropic infusions, nutritional supplements for muscle building, water and alcohol extracts and tinctures. Fenugreek is an instant cure for dermatitis, seborrhea, and acne. The herb is often utilized in cosmetics (Wijaya *et al.*, 2013).

5. Applications of fenugreek

Component usage	Application of fenugreek	References
Seed	Extruded product	(Shirani and Ganesharanee, 2009)
Leaf and seed	Spices and seasonings	(Sowmya and Rajyalakshmi, 1999; Srinivasan, 2005)
Seed	Breads	(Isikli and Karababa, 2005; Thomas *et al.*, 2011; Raju *et al.*, 2001)
Seeds	Dietary fiber, galactomannan	(Blank, 1996)
Fenugreek gum	Extruded product	(Ravindran *et al.*, 2011)
Fenugreek seeds, leaf	Biscuits	(Hussein *et al.*, 2011)

Seeds, leaf	Dietary applications (colour, flavour, odour)	(Ramesh *et al.,* 2001)
Seeds	Curry, condiment, pickle, chutney as a seasoning	(Madar and Stark, 2002)
Seeds	(Incorporated with the flour for bread, yellow-coloured dye) food.	(Srinivasan, 2006)
Seeds, leaves	Palatable character improver	(Srinivasan, 2006)
Seeds	Food equilibrate, gum and emulsification causing- agent	(Jani *et al*., 2009; Sowmya and Rajyalakshmi, 1999)
Seeds	Artificial flavouring	(Blank, 1996)

6. Health benefits

6.1 Antioxidant activity

Fenugreek has flavonoid and phenolic components that aid the herb's increased antioxidant activity (Dixit *et al.,*2005). Some studies indicates fenugreek has potential antioxidative qualities that are advantageous for the pancreas and liver. These properties are evaluated with fenugreek seeds which have been germinated, which also are found to be exceptional to dried seeds since germination improves the bioactivity of various fenugreek constituents (Altunta *et al*., 2005). Fenugreek seeds which have germinated, have been discovered to contain significant antioxidant activity; this activity also attributes to the existence of flavonoids as well as polyphenols (Grover *et al.,* 2002).

6.2 Antidiabetic activity

Diabetes is one of the most common chronic diseases (Raj and Singh, 2022). Fenugreek seed powder used orally may have hypoglycaemic and antihyperlipedemic effects, according to preliminary animal and human experiments. Antidiabetic chemicals from its seed, leaf, and extract have been widely employed as a variety of model systems. It is well recognized that it may be used to treat both type I as well as type II diabetes (Raju *et al*., 2001; Khalki *et al*., 2010). In accordance with research on the glycemic load of fenugreek recipes, the dissolved fibre significantly reduces the glycemic index. In prevention and treatment of the long-term effects of diabetes, diabetic individuals were given around 25 to 50 g of fenugreek daily in their diet (Sowmya and Rajyalakshmi., 1999).

6.3 Anticarcinogenic activity

Fenugreek is a significant herbal herb for supplemental therapy in cancer patients undergoing chemotherapy treatments because it inhibits the cyclophosphamide-induced apoptosis and free radical-mediated lipid peroxidation in the mouse urinary bladder (Bhatia *et al*., 2006). Diosgenin, a crystalline form of the steroid sapogenin that is present in fenugreek, is employed as a pre-cursor in the synthesis of steroid hormones like cortisone and progesterone. It may be helpful in the treatment of cancer, according to recent research (Aggarwal and Shishodia, 2006).

7. Conclusion

Fenugreek is abundant in protein and fibre, and because of its valuable bioactive components, it has potential uses in medicine. Studies have proven that the main therapeutic qualities of fenugreek include antidiabetic, antioxidant, anticarcinogenic, hypoglycemic, and hypocholesterolemic effects. Based on its many health advantages, fenugreek may be included into our everyday diet and added to meals to produce functional foods.

Conflict of interest

The authors declare no conflicts of interest relevant to this article.

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