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Review Article

Amazing Health Benefit of Fenugreek (*Trigonella foenum-graecum leguminosse*)

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Abstract

This novel legume source provides soluble fiber along with other glucose-, cholesterol- and triglyceride-lowering compounds. This seed spice is employed for medicinal purpose in many traditional systems as antibacterial, gastric stimulant, against anorexia, antidiabetic agent and as a galactagogue. In recent decades, several health beneficial physiological attributes of fenugreek seeds have been seen in animal studies as well as human trials. These include antidiabetic effect, hypocholesterolemic influence, antioxidant potency, digestive stimulant action, and hepatoprotective effect. Among these beneficial physiological effects, the antidiabetic and hypocholesterolemic property of fenugreek, both of which are mainly attributable to the intrinsic dietary fiber constituent, have promising nutraceutical value. In this review paper, the potential of fenugreek for disease prevention and health improvement has been emphasized.

Keywords: Diabetes; Phytochemicals; Fenugreek Lactone; Physiological Effects; Antioxidant Potential; Dietary Fibres

Figure 1-4: Pics of fenugreek.

Introduction

Fenugreek (*Trigonella foenum-graecum* Linn.), a short-living, self-pollinating crop, is a native to Indian subcontinent and the Eastern Mediterranean region. It belongs to Fabaceae family and is used extensively in various parts of the world as herb, food, spice, and traditional medicine. Plant-derived natural products have long-standing utility toward treating degenerative diseases [1].

It is estimated that about two-thirds of world population depend on traditional medicine for primary medical needs. Fenugreek is considered as one of the oldest medicinal plants and its health-promoting effects have been cited in Ayurveda and traditional Chinese medicine. In recent decades, several health beneficial physiological attributes of fenugreek seeds have been seen in animal studies as well as human trials. These include antidiabetic effect, hypocholesterolemic influence, antioxidant potency, digestive stimulant action, and hepatoprotective effect. This article presents an overview of experimental evidence for the nutraceutical potential of fenugreek seeds [2].

Phytochemistry and pharmacology

The investigations into the chemical composition and pharmacological actions have seen a renaissance in recent years. Extensive preclinical and clinical research have outlined the pharmaceutical uses of fenugreek as antidiabetic, antihyperlipidemic, anti-obesity, anticancer, anti-inflammatory, antioxidant, antifungal, antibacterial, galactagogue and for miscellaneous pharmacological effects, including improving women's health. The pharmacological actions of fenugreek are attributed to diverse array of phytoconstituents. The phytochemical analysis reveals the presence of steroids, alkaloids, saponins, polyphenols, flavonoids, lipids, carbohydrates, amino acids, and hydrocarbons. It is also used for conditions that affect heart health such as "hardening of the arteries" (atherosclerosis) and for high blood levels of certain fats including cholesterol and triglycerides. Fenugreek is used for kidney ailments, a vitamin deficiency disease called beriberi, mouth ulcers, boils, bronchitis, infection of the tissues beneath the surface of the skin (cellulitis), tuberculosis, chronic coughs, chapped lips, baldness, cancer, Parkinson's disease and exercise performance [1].

Fenugreek has been associated with increased testosterone levels and enhanced sexual function in middle age men with androgen deficiency symptoms, as well as with a reduced severity of both menopausal symptoms and dysmenorrhea, including menstrual pain, fatigue, headache, nausea and lack of energy. These hormone-regulating actions, equally beneficial for both men and women, are attributed to a high content of phytoestrogens (stearic acid, palmitic acid, and beta-sitosterol) and steroidal saponins (diosgenin, tigogenin, neotigogenin, and yamogenin).

The presence of phytomenadione (a vitamin K derivative that aids coagulation), as well as alkaloids, aminoacids (such as lysine), also contributes to the galactagogue, hypoglycemic, and hormone balancing properties of fenugreek. Additionally, fenugreek's omega-3 fatty acids and dietary fiber, as well as a water-soluble polysaccharide called galactomannan (Figure 5), are thought to contribute with the beneficial effects of fenugreek on metabolic functions. Galactomannan has been shown to help regulate digestive enzymes, also inhibiting the absorption of glucose in the gastrointestinal tract. Fenugreek seeds contain no essential oil and their characteristic scent and flavor are due to the presence of fenugreek lactone (Sotolone figure 5), an extremely powerful odorant agent.

Figure 5: Galactomannan structure.

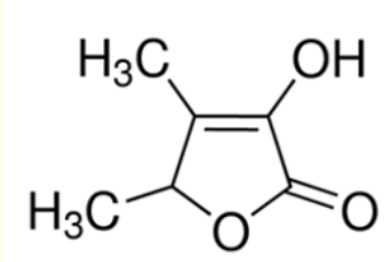

Figure 6: Structure of fenugreek lactone.

Use of fenugreek in day to day life

Methi seeds are a great remedy for diabetics. Methi helps in controlling the blood sugar level. The amino acid compounds in fenugreek seeds increase insulin secretion in the pancreas which helps in lowering the blood sugar level in the body.

Consumption of fenugreek helps in treating kidney stones. Methi seeds help in improving kidney health. Drinking methi water will keep you full for long. Methi is packed with fiber which gives you a feeling of fullness. This helps you manage your weight. When you feel full, you don't eat many calories and also prevents you from bingeing on unhealthy snacks. It also prevents bloating. Fenugreek seeds have nutrients that help in hair growth. Consuming fenugreek water will promote hair growth, improve hair volume and keep hair problems such as dandruff, roughness at bay. Fenugreek or methi water helps in flushing out the harmful toxins from your body and it helps in improving your bowel movement. It helps you fight against digestive problems. It prevents constipation, indiges-

tion among other digestion problems [3]. Methi is immensely useful for your skin and hair too.

Fenugreek is taken for digestive problems such as loss of appetite, upset stomach, constipation, inflammation of the stomach (gastritis). Fenugreek is also used for painful menstruation, polycystic ovary syndrome, and obesity. Some men use fenugreek for hernia, erectile dysfunction (ED), male infertility and other male problems. Both men and women use fenugreek to improve sexual interest. Fenugreek is used for a variety of purposes. Fenugreek seed extract is the principal flavoring ingredient of simulated maple syrup. It is also used as a tobacco-flavoring ingredient, hydrolyzed vegetable protein flavor, perfume base, and a source of steroid sapogenin in drug manufacturing industries. The leaves are commonly consumed as a vegetable [4].

Currently, there is not enough conclusive evidence to fully support the use of fenugreek for any medical purpose.

However, people have been using fenugreek in varying forms for hundreds or potentially thousands of years to treat a very wide range of conditions, such as: digestive problems, including constipation, loss of appetite, and gastritis; breast milk production and flow; diabetes; low testosterone or libido; painful menstruation; menopause; arthritis; high blood pressure; obesity; breathing problems; boils; low exercise; performance; ulcers; open wounds; muscle pain; migraines and headaches; childbirth pains.

Of all the reported health benefits of fenugreek, only a few have been substantially backed by scientific evidence.

Among other benefits, some research suggests that fenugreek may:

- Reduce the risk of diabetes.

Quite a few studies in animals have shown that at least four compounds in fenugreek have antidiabetic properties. They primarily:

- Reduce intestinal glucose absorption; delay gastric emptying.
- Improve insulin sensitivity and action; reduce concentrations of lipid-binding protein.

In a 2017 study, mice fed a high-fat diet with 2 percent whole fenugreek seed supplementation for 16 weeks had better glucose tolerance than those who did not receive the supplementation. However, the fenugreek did not improve glucose tolerance in the mice who ate a low-fat diet. Also, the authors concluded that 4 days of voluntary exercise on a spinning wheel was ultimately more effective at improving glucose tolerance in all the mice than fenugreek. Overall, the researchers found fewer benefits from fenugreek than they expected.

Improve milk production and flow

Fenugreek may help stimulate breast milk production and ease the flow. Practitioners of traditional Asian medicine have long recommended fenugreek for this purpose. In a 2014 study, 25 women who had recently given birth drank three cups of fenugreek tea daily for 2 weeks and saw an increase in milk volume in the first weeks.

Improve weight loss

Fenugreek may suppress the appetite and increase feelings of fullness, which could help reduce overeating and lead to weight loss. In a 2015 study, nine overweight female Korean participants drank a fennel, fenugreek, or placebo tea before lunch. Those who drank fenugreek tea reported feeling less hungry and more full. However, the tea did not cause the participants to consume less. Because of the fiber content, fenugreek fiber extract powders may also lead to a feeling of fullness.

Raise testosterone and boost sperm count

Fenugreek may help increase low testosterone and sperm levels. In a 2017 study, 50 male volunteers took an extract of fenugreek seeds for 12 weeks. About 85 percent of the participants had an increased sperm count. The results also indicate that the extract consistently improved mental alertness, mood and libido.

Reduce inflammation

The substantial levels of antioxidants in fenugreek give it great potential as an anti-inflammatory agent. Results of a 2012 study in mice suggest that the high antioxidant flavonoid content in fenugreek seeds can reduce inflammation.

Reduce the risk of heart and blood pressure conditions

Fenugreek may help regulate cholesterol levels and improve blood pressure, which can reduce the risk of developing heart conditions and improve heart health. This may be because fenugreek seeds contain roughly 48 percent dietary fiber. Dietary fiber is very hard to digest, and it forms a viscous gel in the intestines that makes it harder to digest sugars and fats.

Pain relief

Fenugreek has long been used for pain relief in traditional systems of medicine. Researchers think that compounds called alkaloids in the herb help block sensory receptors that allow the brain to perceive pain. In a 2014 study, 51 women with painful periods took capsules of fenugreek seed powder three times a day for the first 3 days of their periods for 2 consecutive months. They experienced shorter durations of pain and fewer symptoms between the months [5-8].

Conclusion

The evidence to date suggests that fenugreek can be a potential natural health product for the prevention and treatment of type II diabetes. This novel legume source provides soluble fiber along with other glucose-, cholesterol-, and triglyceride-lowering compounds. It would be a significant contribution to the daily management and stabilization of blood glucose and lipid levels for non-insulin-dependent diabetics. Fenugreek has antioxidants and anti-inflammatory properties. Among the spices that are esoteric food adjuncts being used to enhance flavoring and color, fenugreek (*Trigonella foenum-graecum*) also modifies the texture of food. This seed spice is also employed for medicinal purpose in many traditional systems as antibacterial, gastric stimulant, against anorexia, antidiabetic agent and as a galactagogue. It is important to increase awareness of the public, dieticians, and other health professionals as to the unique properties of fenugreek and to recommend it for the prevention of hyperglycemia and hyperlipidemia.

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