

## The Fenugreek Herbal Tea Product for Women's Health

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### ABSTRACT

This study explores the phytochemical review of a medicinal plant, called *Trigonella foenumgraecum* L. or fenugreek. It is known regionally as halba in Malay or hilbeh in Middle East. This traditional herb is used to treat dysmenorrhea, in the episodes of painful uterine contractions, during menstruation. Community retail outlets would provide this natural resource as polypharmacy, which involves a mixture of fenugreek and other herb, e.g. cinnamon. The pharmacological properties of the fenugreek were investigated, including antidiabetic, antioxidant, anti-inflammatory, anticancer and antimicrobial activities. Much information is available for this species, e.g. in the form of herbal capsule and tea product. From the literatures, laboratory experiments were conducted, in order to quantitatively validate the bioactive components. The isolation of its natural molecules, for example diosgenin, an important steroidal sapogenin, could be achieved without extraction. It is expected that fenugreek seeds could function as a mild galactagogue.

KEYWORDS: fenugreek, review, tea, *Trigonella*, women

## 1 INTRODUCTION

The fenugreek (*Trigonella foenum-graecum* L.) belongs to the Fabaceae or Leguminosae family [1]. This herb is grown in the North Africa, South Asia, Middle East and Mediterranean Europe [2]. It is used in pharmaceutical, nutraceutical and functional food industries, owing to its phytochemicals in the seeds and leaves [3]. The fenugreek is an important traditional medicine [4]. The leaves and seeds are used to lower the cholesterol and blood glucose level. It is reported as antimicrobial [1], anti-cancer [5] and anti-inflammatory agents [6]. The most important constituents in the fenugreek seeds are steroidal sapogenins such as diosgenin, yamogenin, tigogenin, flavonoids such as quercetin, phytic acid, apigenin, luteolin, orientin, vitexin and isovitexin, alkaloids (trigonelline), complex carbohydrate (galactomannan) and amino acids (e.g. 4-hydroxyisoleucine) [3].

## 2 OBJECTIVE

There is still a lack of analysis on the fenugreek components, derived from different polarity of organic solvents. Moreover, previous experiments specialized solely in single solvent extraction. Therefore, the objective of this study is to perform the literature search on *Trigonella foenum-graecum* L. by reviewing the electronic journals [7-11]. Laboratory experiments involving the maceration of the seed samples are on schedule, subsequent to this critical review, in a hope to examine the chemical composition in the fenugreek seeds extract. A form of tea product for fenugreek is also suggested.

## 3 SIGNIFICANCE(S)

This study reviews the plant profile, biological activities, medicinal use and chemical composition in the seeds of *Trigonella foenum-graecum* L. The finding will benefit community in which it provides the information on how fenugreek can help in maintaining women's health.

## 4 METHODOLOGY/ TECHNIQUE

The literature search on *Trigonella foenum-graecum* L. was conducted electronically (e.g. Science Finder, Medline, Scopus, Pubmed, Web of Science and Google Scholar). The English and Malay articles were analyzed and reviewed [12]. Meanwhile, the crude drug, which is the fenugreek seed, was obtained from trade. Similarly, the polyethylene pouch of two different sizes were purchased from the retail. Two types of pouches were used, which include the small (90 cm x 70 cm) and medium (110 cm x 105 cm) sizes. The seeds (2 table spoons, 2 grams of the fenugreek seeds, Fig. 1 [13]) were placed inside those pouches.



Fig. 1: The fenugreek seeds are round to rectangular shape, and commonly are in irregular, brick shaped.

## 5 RESULT

From the literatures, an example of duplicate publication on *T. foenum-graecum* is observed [14-15]. Preclinical data and clinical findings are provided [16-17] and some updates are listed and shown in Table 1. Laboratory experiments were also conducted, in order to quantitatively validate the bioactive components. The isolation of its natural molecules, for example

diosgenin, an important steroidal sapogenin, could be achieved without extraction. It is expected that fenugreek seeds could function as a mild galactagogue [13, 19]. The chemical structure of the tea component, for example, the polysaccharide, is shown (Fig. 2). It is found as the phytochemical with no toxicological effect and could potentially act as a drug candidate against breast cancer [20, 21].

Table 1: Pharmacological activities of fenugreek extracts.

Pharmacological activities of <i>Trigonella foenum graecum</i> L.	Source
Fenugreek seed and its oil as the antimicrobial agent to be used as a food preservative or in medical industries	[1]
The methanol, ethanol, dichloromethane, acetone, hexane and ethyl acetate extracts of the fenugreek exhibit antioxidant activity	[2]
The antioxidant activity of the ethanol extract was evaluated using DPPH free radical scavenging assay and it was found to have significant antioxidant activity	[22]
The anti-bacterial activity of fenugreek against <i>E. coli</i> and <i>Staphylococcus</i> was reported to be more effective with methanol extract. The leaf extracts were found to have maximum antibacterial as compared to the seeds extracts.	[23]
The administration of <i>T. foenum-graecum</i> seed powder solution had pronounced effects in improving lipid metabolism in type II diabetic patients with no adverse effects.	[24]
The computational results reveal that fenugreek's galactomannan can be ascribed as potential drug candidate against breast cancer and type 2 diabetes rendered by higher molecular dock scores, stable molecular dynamics simulations results, and lower binding energy calculations.	[23]

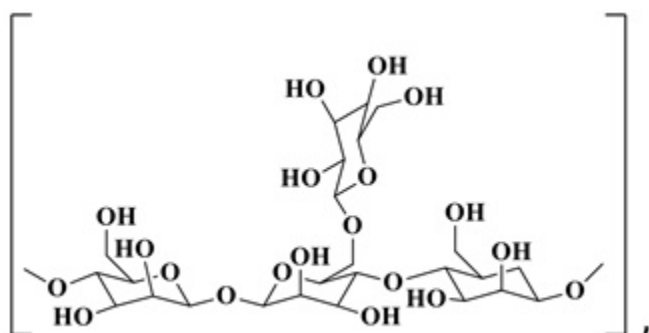


Fig. 2: The structure of fenugreek's galactomannan.

## CONCLUSION

The demand for fenugreek products to be used as an alternative medicine is growing worldwide. Therefore, the knowledge and scientific evidence of botanical *Trigonella* is important for consumers. In conclusion, the chromatographic methods for the extracts could be adapted, without difficulty, from the fenugreek monograph of British Pharmacopoeia.

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