Acta Scientific NUTRITIONAL HEALTH (ISSN:2582-1423)

Volume 8 Issue 11 November 2024

Research Article

Ethnobotanical Survey on the Traditional Use of Fenugreek (*Trigonella foenum-graecum* L.) in the Jendouba Region (Northwest of Tunisia)

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Received: August 22, 2024

Published: October 30, 2024

Abstract

Nowadays, several studies have identified the multiple significant effects of bioactive components extracted from medicinal plants used in the treatment or prevention of metabolic disorders and pathologies. In this regard, it is essential to restore the ancient recognition of the plants used in traditional medicine. In the same context, the present study established an inventory containing several data related to the use of a traditional natural remedy, fenugreek (Trigonella foenum-graecum), still frequently used by the population of the Jendouba region.

The obtained results showed that fenugreek seeds were frequently used for the treatment of various disorders and pathologies of the digestive, urinary, circulatory, and respiratory systems.

The inventories indicate a limitation on the use of fenugreek in its seeds. These mature dried seeds are used very frequently (25.53%) and in moderation (57.39%).

Importantly, the fenugreek preparations are various. However, the most commonly used is maceration (42%), followed by decoction (25%). The various fenugreek seed preparations are used mainly orally (76.8%) and dermally (23.2%).

Keywords: Ethnopharmacolological Survey; Ancestral Pharmacology; Trigonella foenum-graecum, Traditional Medicine

Introduction

Scientific research in medicine is being further advanced to meet the increased demands for resources and solutions in response to the complexity and infinite proliferation of diseases. Thus, herbal medicine, or phytotherapy, has regained interest and currently represents the most pressing new research direction [1].

Plants represent a very interesting renewable source, providing raw materials for various fields, namely agri-food, plant protection, cosmetics, and the pharmaceutical industry [2].

Furthermore, on a global scale, 35,000 plant species are used for their medicinal properties, making flora the most biodiverse domain exploited by humans. Thus, the demand for medicinal plants continues to grow regardless of the developments in modern pharmacology [3].

Thus, most pharmacological and medicinal products are derived from plant constituents. Also, plant products can be used as prototypes for biologically active compounds [4].

The concepts of ethnopharmacology and ethnobotany focus on the study of the cultures and practices of populations regarding medication using indigenous and allogenic flora to treat and prevent various pathologies [5].

However, it is detrimental to discover more therapeutic virtues of plants by first relying on ethnopharmacological data, phytochemical screening, and *in vitro* and *in vivo* studies.

In this context, we were interested in conducting an ethnopharmacological survey regarding the use of fenugreek (*Trigonella foenum-graecum* L.) in traditional medicine among the population of Jendouba (Northwest Tunisia).

Materials and Methods

Choice of the region of study

The region of Jendouba (northwest Tunisia) was selected since it is one of the top fenugreek-producing areas in Tunisia and is known for the common utilisation of this plant.

Presentation of the survey form

In order to conduct this survey, we initially developed two different types of questions. The first kind looks for information on the respondent's civility, including age, occupation, educational attainment, etc. The second is meant to explain how the plant is used in conventional medicine, along with its medicinal properties, preparation methods, and frequencies of administration.

Methodology

Once the questionnaire was formulated and verified, we prepared 300 copies of the survey form, which were distributed to the respondents. Briefly, we introduced ourselves using a badge for identification, and the respondents were pre-selected to ensure satisfactory answers. Moreover, the individuals inventoried are generally represented by elderly peasants, small rural merchants, herbalists, and farmers.

The residents of the Jendouba region were questioned about the different uses of fenugreek in traditional medicine. During the investigation, we detailed and clarified all the questions to make them understandable for all the respondents. From the beginning of the discussion, the questionnaire was filled out by the interlocutor, and we listened carefully to the interviewed person, and all the additional information regarding the virtues of the plant was noted.

Statistical study

The data was analyzed in Excel and inputted using the Sphinx software. Quantitative variables were represented by the mean and standard deviation, while qualitative variables were described using percentages.

Results

The obtained results during the ethnopharmacological survey conducted in the Jendouba region have proven that fenugreek seeds (*Trigonella foenum-graecum* L.) were used in traditional medicine for the treatment of a wide range of pathologies, including diabetes, hypertension, and diseases of the digestive and urinary systems.

Distribution of respondents by age group

The collected results show that the age range of the surveyed individuals varies between 20 and 72 years, with the majority belonging to the age group of 30 to 60 years (Figure 1).

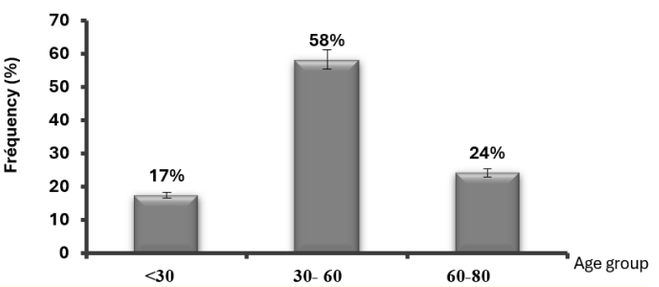

Figure 1: Distribution of respondents by age group.

Distribution of respondents by gender

The surveyed inhabitants are represented by 61% women and 39% men (Figure 2).

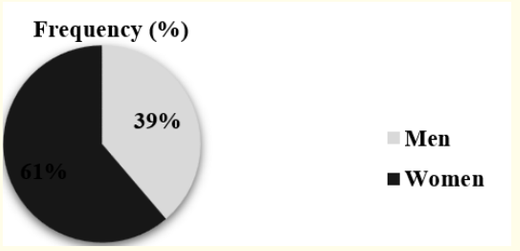

Figure 2: Distribution of interrogated by gender in the Jendouba region.

Educational level of the respondents

The survey conducted in the Jendouba region showed that 51% of the surveyed persons have a secondary education level, while university and primary education levels represent 18% and 26%, respectively, of the surveyed population (Figure 3).

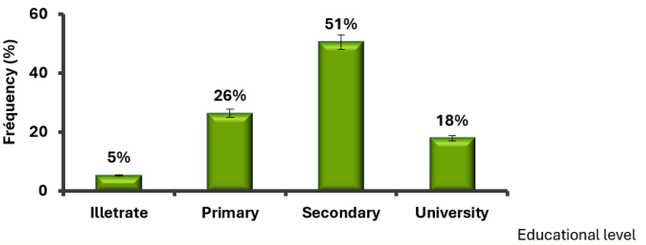

Figure 3: Distribution of the questioned according to their educational level.

Source of information on *Trigonella foenum-graecum*

The majority of respondents (83.96%) indicated that their main source of information about the benefits of fenugreek was directly transmitted from their parents and older people in their surroundings. On the other hand, 16.04% of them state that they were informed about the plant through the internet and by consulting some books on Tunisian medicinal flora (Figure 4).

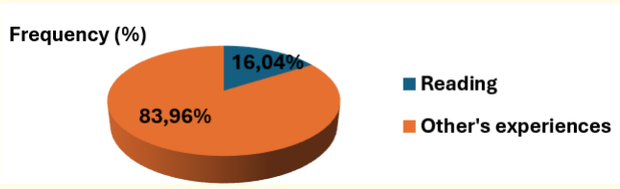

Figure 4: Information sources for the respondents.

Traditional and medicinal use of fenugreek

The inhabitants of the Jendouba region declared that fenugreek is widely used in traditional medicine for the treatment of various ailments and metabolic issues. Indeed, fenugreek is primarily used for the treatment of diabetes (38%), digestive tract diseases (26%), hypertension, and lipid metabolism disorders (15%), and is also rarely used in the treatment of certain skin diseases (9%) (Figure 5).

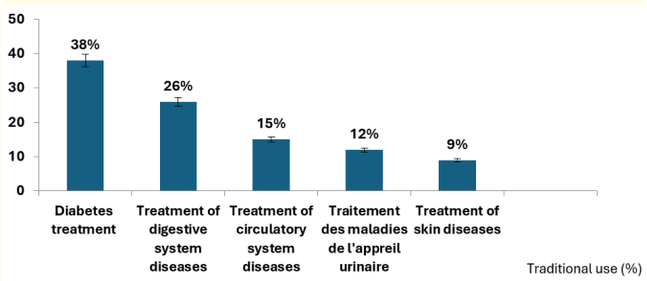

Figure 5: Different medicinal uses of fenugreek in Jendouba population.

The parts employed of fenugreek

The individuals participating in the survey indicated that the seeds were the only part of fenugreek that was used for the treatments (Figure 6).

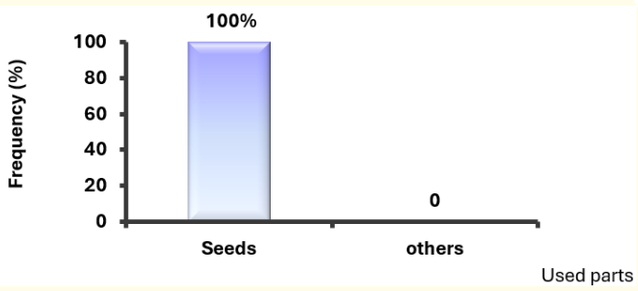

Figure 6: Frequency of fenugreek seeds use among the population of Jendouba.

Gathering stage

The survey results revealed that the respondents use only mature fenugreek seeds (Figure 7).

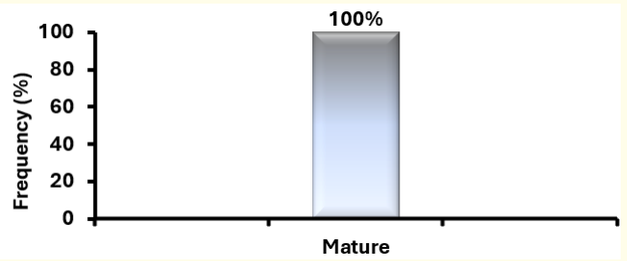

Figure 7: Percentage of harvesting stages.

Preparation methods

The respondents indicated that they mainly used the seeds to prepare macerations (42%) and decoctions (25%), which were consumed after filtration. Fenugreek seed powder is either dissolved in water and the resulting juice is consumed entirely (5.5%), or it is employed in the form of pastes as poultices (27.5%) (Figure 8).

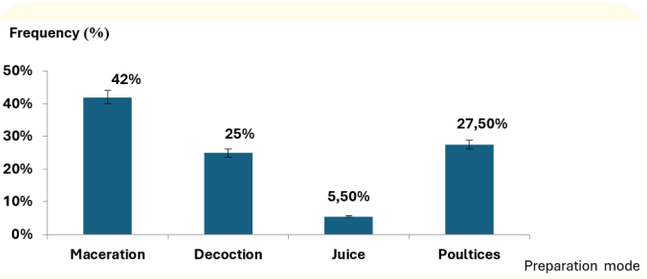

Figure 8: Frequency of different preparation methods for fenugreek.

Modes of administration

The participants assert that infusions, decoctions, and fenugreek drinks were commonly consumed orally (76.8%) to treat diabetes, dyslipidaemia, hypertension, urinary tract infections, and diarrhea. It is also indicated as an antipyretic and detoxifying agent and a hepato-nephronal protector for chronic cough and bronchitis. The results show that the frequency of external use of fenugreek is around 23.2%. Indeed, it is used in the form of a poultice to treat abscesses, skin infections, and eye inflammations (Figure 9).

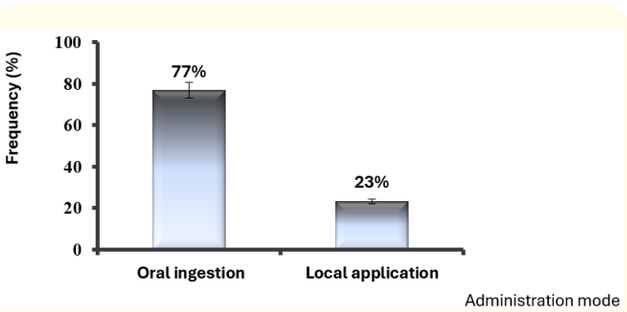

Figure 9: The different fenugreek modes of administration.

Form of use

The local population only mentioned that fenugreek seeds were used only in their dry form (Figure 10).

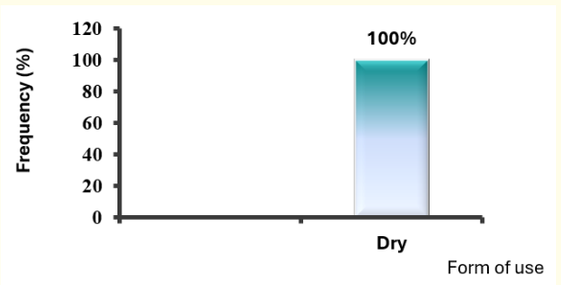

Figure 10: The form of fenugreek seeds used.

Frequency of use

The surveyed individuals revealed that they use fenugreek seed extracts moderately (57.39%) and very frequently (25.53%), depending on the types of pathologies and cases being treated. Indeed, these seeds were characterized by multiple therapeutic virtues, and despite the high doses used, no side effects or toxicity have been reported (Figure 11).

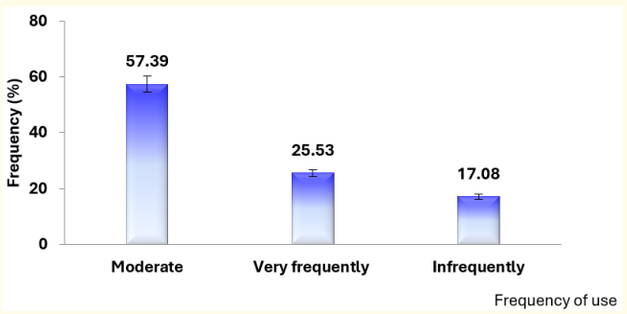

Figure 11: Frequency of fenugreek use in the Jendouba region.

Degree of satisfaction

The assessment of the degree of satisfaction regarding the use of fenugreek showed that the respondents are very satisfied (54.27%) and satisfied (28.56%) with various care and treatments (Figure 12).

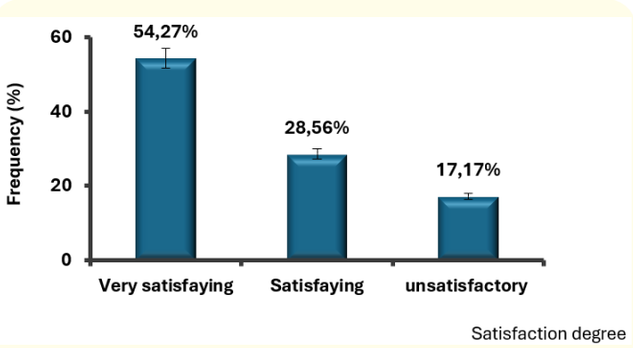

Figure 12: Determination of the satisfaction levels of respondents regarding the use of fenugreek.

Reasons for phytotherapy

The population of Jendouba has indicated that the use of fenugreek in traditional medicine is very widespread, which is mainly explained by its effectiveness in treating various pathologies (52%). Likewise, these seeds are more preferred compared to modern medicine products (39%). Furthermore, these seeds are characterized by their low price and wide availability in regional markets (9%) (Figure 13).

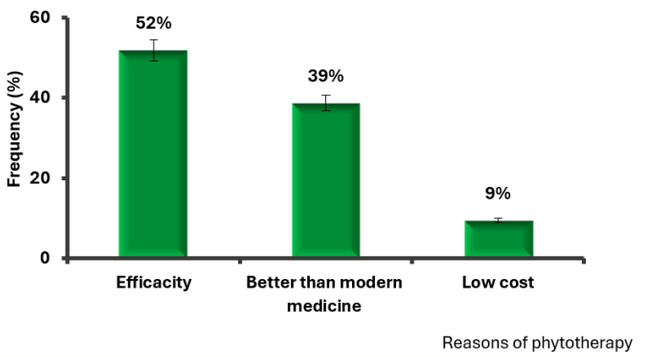

Figure 13: The reasons for using fenugreek in phytotherapy.

Discussion

The present ethnopharmacological survey, involving 300 inhabitants of the Jendouba region, aimed to inventory the traditional use of fenugreek. The obtained results revealed that the majority of respondents were aged between 50 and 70 years. The determination of educational levels indicated that most participants have a secondary level (51%), followed by primary (26%) and university (18%).

The majority of interviewed persons (83.96%) indicated that the information they acquired was from grandparents and older people in their surroundings. On the other hand, 16.04% of the participants indicated that this information comes from the internet and reading related to Tunisian flora.

The results of this investigation have supported the traditional medical practice of using fenugreek seeds to treat numerous illnesses and health disorders.

The surveyed population revealed that the seeds were primarily used in the form of macerations, decoctions, and juices. On the other hand, these seeds are used as a poultice for skin care. Our results are in line with the studies of Benkhnigue., *et al.* [6], indicating that fenugreek seeds are used in the form of poultices, maceration, decoction, and juice.

The uses of fenugreek seed extracts were very frequently. According to the collected responses, daily use of fenugreek in high quantities has no unexpected or undesirable effects. Thus, Billaud

and Adrian [7] indicated that 35 to 50 grams of fenugreek seeds can be consumed daily.

The conducted survey in the Jendouba region revealed that extracts of *Trigonella foenum-graecum* are primarily consumed orally (66%) to treat diabetes, hypertension, and digestive system diseases such as diarrhea and digestive tract infections. The population uses fenugreek to stimulate and facilitate digestion; moreover, it is recommended in the treatment of various liver diseases. Furthermore, fenugreek has been used for its diuretic effect; it is employed as a kidney cleanser, for the treatment of urinary tract infections, and for metabolic disorders such as dyslipidaemia and gout.

In the same context, several previous studies have demonstrated the multiple virtues of these seeds; according to Sauvaire., *et al*. [8], this plant is characterized by its cardio-protective properties as it is used to regulate cholesterol and triglyceride levels. It is also used for the treatment of diabetes due to its hypoglycemic ability [9]. Moreover, it is known for reducing insulin resistance in individuals with type 2 diabetes [10].

Fenugreek seed extracts were characterized by a strong anti-inflammatory and antipyretic capacity comparable to that of paracetamol, which is used as a reference anti-inflammatory molecule [11]. On the other hand, the nephroprotective and purifying properties of fenugreek have been confirmed [12].

In terms of the digestive system, the use of these seeds is recommended to treat indigestion, digestive disorders, and several disorders and pathologies of the stomach, colon, liver, and gallbladder [13,14].

Regarding the method of application, the results showed that 22% of respondents used it externally. Indeed, the seeds of *Trigonella foenum-graecum* are ground and applied as a poultice in many medical procedures for the skin mucosa to treat several diseases, such as canker sores, abscesses, and skin mycoses. Our results are in agreement with Yadav and Baquer [13] and Andre., *et al*. [15], indicating that fenugreek seeds were recommended for the treatment of skin issues such as irritations, acne, eczema, and the healing of dermal wounds. It should be noted that fenugreek is also used for scalp care [14] and the treatment of eye inflammation [13].

Conclusion

The investigation conducted in the Jendouba region has effectively identified and described the use of fenugreek seeds as an effective remedy and beneficial dietary supplement. Indeed, the extracts and products of *Trigonella foenum-graecum* are commonly used and/or in high doses, safely and without risks of toxicity or adverse effects. At the end of this work, we can suggest that its wide range of uses in traditional medicine are largely related to its richness in biologically active compounds, specifically polyphenols.

Acknowledgement

The authors are grateful for the membersof the Laboratory of Functional Physiology and Valorization of Bioresources at the Higher Institute of Biotechnology of Beja, University of Jendouba, for their invaluable support.

Research Ethics Committee Approval

The publication of the research paper in any open access journal has been authorised.

Conflicts of Interest

The authors declare that they have no conflict of interest.

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