

Germinated and non-germinated seeds of *Trigonella foenum-graecum* L.: phytochemical and *in ovo* evaluation

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BACKGROUND

- *Diabetes mellitus* a worldwide burden with an increasing prevalence
- Limitations and side effects associated with traditional pharmacological treatments
- Medicinal plants and natural compounds effective and safe therapeutic alternatives for diabetic patients
- *Trigonella foenum-graecum* L., or fenugreek, a species in the *Fabaceae* family, known for its beneficial traditional uses in metabolic disorders

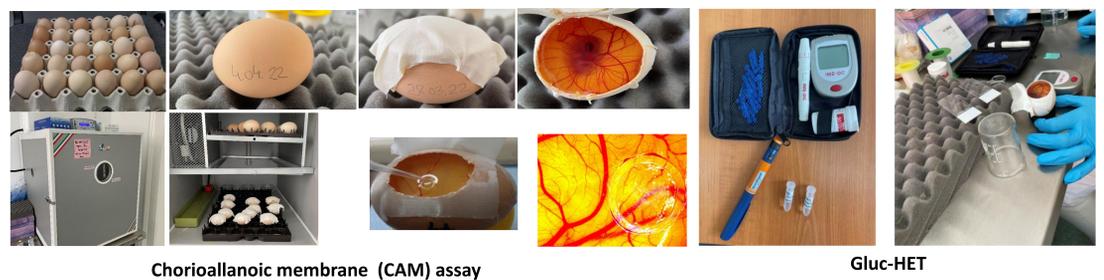
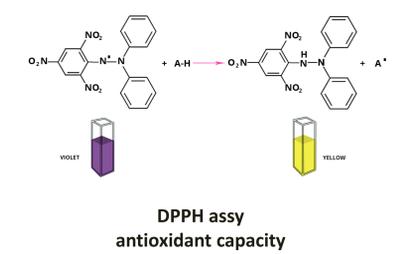


OBJECTIVES

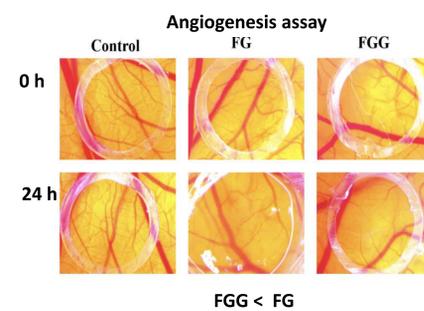
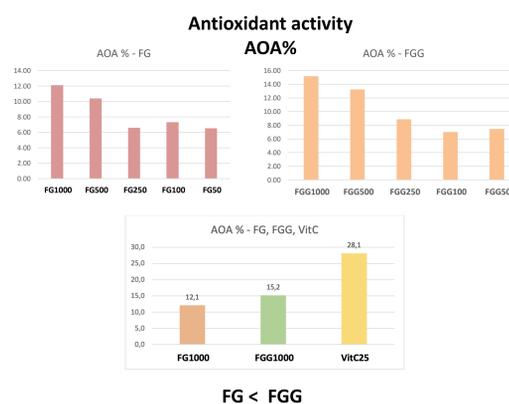
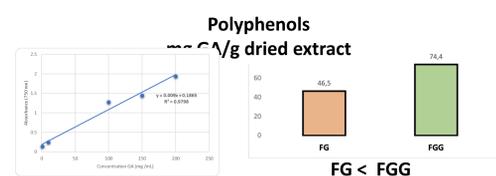
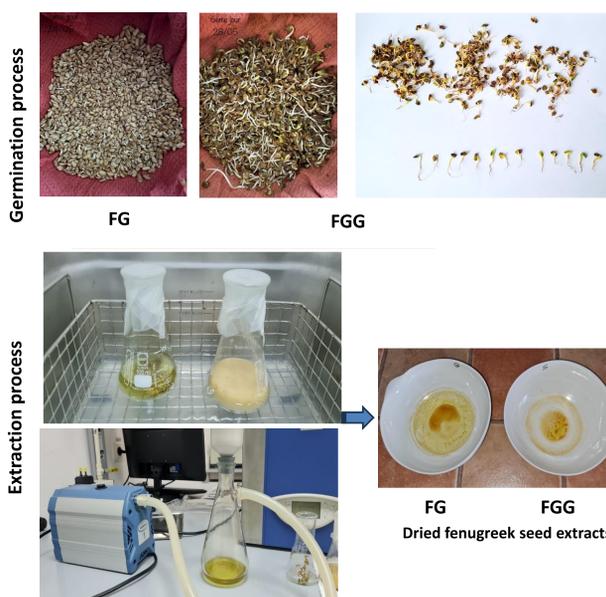
- The present study aimed to evaluate the potential implications of fenugreek seeds in the management of diabetes by assessing:
- Germinated and non-germinated seed extracts
 - Polyphenolic and antioxidant evaluation
 - Angiogenesis and blood glucose values *in vivo*

MATERIALS and METHODS

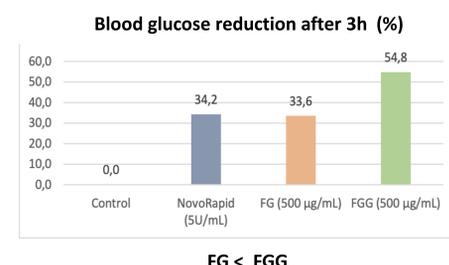
- The experimental design involved fenugreek dried seeds obtained from Tunisia
- Germination process for 10 days
- Ethanolic (96%) extracts from germinated and non-germinated seeds of fenugreek, using an ultrasonic bath for 30 minutes at 45°C
- The polyphenolic content using the Folin Ciocalteu method and expressing results as gallic acid equivalents
- Antioxidant capacity by the DPPH assay, using ascorbic acid as control
- *in vivo* assays using the *in ovo* chicken chorioallantoic membrane
 - From day 7 of incubation – 5 microL of extracts in DMSO and angiogenesis evaluation by stereomicroscopic image analysis
 - From day 11 of incubation - Gluc-HET adapted protocol for blood glucose levels, using Novo Rapid Insulin as control



RESULTS AND DISCUSSIONS



FG extract induced a more pronounced vascular reducing effect than FGG. Modulation of angiogenesis process is a key of vascular complications in diabetes



FGG extract were lower than those of FG, which correlates with the high levels of polyphenols and the antioxidant effect.

CONCLUSIONS

Both germinated and non-germinated fenugreek seeds showed high levels of polyphenolic compounds contained in fenugreek seeds, next to significant antioxidant capacity. The *in vivo* results indicated a higher ability to reduce blood glucose compared to Novo Rapid insulin, especially for the germinated seed extract. Using the CAM method, we also observed the effects of reducing the number of new capillaries by the non-germinated extract, thus suggesting also a possible option addressing vascular complications of diabetes.