



## Effect of Ultrasound on Germination, Growth and Production of Trigonellin in Fenugreek *Trigonella foenum graecum* L.

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Fenugreek (*Trigonella foenum-graecum* L.) is an annual plant, belonging to the legume family and is native to Iran. This plant is one of the most important medicinal plants in the world due to the production of alkaloids, steroids, saponins and high therapeutic power [1]. This study was conducted to evaluate the effect of ultrasound on germination of seeds, growth and production of trigonellin in fenugreek plant. Experiment was performed in a completely randomized design with 3 replications. Ultrasound (40 KHz) was treated on seeds for 0, 5 and 10 minutes. Untreated seeds were considered as control. The measured parameters were root length, leaf number, root fresh weight, shoot fresh weight, chlorophyll a, chlorophyll b, carotenoid, total phenolics, flavonoids, anthocyanins, antioxidant potential, vitamin C, lipids peroxidation, hydrogen peroxide, protein, phenylalanine ammonia lyase (PAL) activity and trigonellin content. The results showed that ultrasound had a significant effect on all measured parameters. Mean comparison also showed that the ultrasound (5 minutes) significantly increased in germination index, germination rate, fresh weight, root length, shoot length, leaf length, leaf area, leaf number, root fresh weight, shoot fresh weight, total phenolics, flavonoids, antioxidants, vitamin C, and trigonellin content compared to the control. In 10 minute ultrasound treatment, the mean of protein, enzyme, PAL has a significant effect on control treatment and has increased the yield of traits. In contrast, in 10 min ultrasound treatment, the amount of protein and PAL activity increased significantly compared to the control, but there was a significant decrease in the anthocyanin content, germination rate, root and shoot length compared to the control. These responses seem to be due to the sensitivity of the seeds of the fenugreek medicinal plant to ultrasound.

**Keywords:** Fenugreek, Ultrasound, Germination, Growth, Trigonellin

### Reference

[1] Mehrafarin, A.; Qaderi, A.; Rezazadeh, Sh.; Naghdi Badi, H. *J. Med. Plant.* **2010**, *35*, 1-18.