
Allelopathic effect of *Thapsia garganica*

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Abstract

In the present work, the phytotoxicity of *Thapsia garganica* was evaluated through the effect of its different organs aqueous extracts (10, 20, 30, 40, 50 g/L) and organic ones with petroleum ether, ethyl acetate and methanol at 1, 3 and 6 mg/mL, on lettuce germination and growth. The methanol extracts had the strongest inhibitory effect on germination, which was completely inhibited at all concentrations, followed by the aqueous leaves extract at 50 g/L and the germination rate did not exceed 5%. The inhibition of germination by leaves aqueous extracts could be attributed to membrane disintegration, shown by an electrolytes leakage increase, compared to the control, which reached 166.06 %. A germination delay was also recorded, with the exception of petroleum stem extracts. As regards lettuce growth, the measurement of roots and aerial parts length showed that the most significant toxicity was observed with the methanol and aqueous extracts. The ethyl acetate stems extract had a stimulating effect on roots length. The largest value was 83.43% of control at 1000 ppm. In front of allelopathic stress, the lettuce seeds have developed a defense strategy manifested by an accumulation of sugars, an increase of the dehydrogenase activity, and an improvement of seedlings hydration. The study of the effect of leaves methanolic extract on *Tribolium castaneum* and *Spodoptera littoralis* showed that this plant has an insecticide activity. The repellent and toxic activity (by forced ingestion and topical application) against *T. castaneum* was demonstrated. For *S. littoralis*, despite the low anti-feeding of caterpillars, a decrease in the growth rate and conversion of digested and ingested food to biomass, an increase in the approximate digestibility, and a delay of the larval development until mortality were recorded. The larval mortality was caused by exuviation difficulties and various degrees of morphogenesis abnormalities were observed in nymphs.

Keywords: *Thapsia garganica*, phytotoxicity, lettuce, insecticidal potential

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