

Investigation of phenolic compounds and biological properties of vegetative organs of *Lepidium vesicarium* L.

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Introduction: Despite a long history of medicinal use of *Lepidium vesicarium*, the phenolic compounds and biological activity studies have not been performed on different organs of the plant.

Material and Methods: after obtaining methanolic extract of the different organs (root, leave, stem, branch, and seed), the total phenolic and flavonoid contents were assayed by spectrophotometric methods, and antioxidant and cytotoxic properties were evaluated by DPPH and MTT methods, respectively, and then free and esterified phenolic acids were analyzed by HPLC.

Results: According to the results, the methanolic extracts of seed and leaf had the highest total phenolic content, and the maximum flavonoid content was related to the stem and seed extracts. The investigation of antioxidant and cytotoxic activity against MCF-7 cells showed that the highest antioxidant activity was related to the methanolic extract of seed, and extracts of stem and seed had the highest cytotoxic activity. The results of phenolic acids analysis indicated that caffeic acid with the amounts of 1.44 ± 0.16 and 1.11 ± 0.09 mg/g dry weight was the main free phenolic acids in the leaf and branch extracts, respectively. Also, salicylic acid and m-coumaric acid with the amounts of 0.98 ± 0.07 and 0.95 ± 0.07 mg/g dry weight were the predominant esterified phenolic acid in the root and branch extracts, respectively.

Conclusion: Therefore, based on the results, seeds have the highest phenolic compounds, including caffeic, ferulic and gallic acids and due to its high antioxidant potential and cytotoxicity, it can be used in the pharmaceutical and food industries.

Keywords: Antioxidant, Caffeic acid, Cytotoxic activity, Gallic acid, *L. vesicarium*