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Unrevealing the total phenols, total flavonoids, antioxidant, anti-inflammatory, and cytotoxic effects of Garden Cress seed ethanolic extracts

Abstract:

For many years, natural bioactives have been used to treat, cure, and prevent diseases. Crude extracts from fruit seeds have been demonstrated to possess a range of advantageous biological properties, including anti-inflammatory, antioxidant, and anti-tumorous effects. In this study, the seeds of Garden Cress (*Lepidium sativum*, Cr) were extracted using ethanol as a solvent and two extraction techniques. These methods are microwave-facilitated extraction and successive microwave-ultrasound-assisted extraction, resulting in Cr-1 and Cr-2, respectively. These two ethanolic extracts were investigated for several biochemical characteristics, including flavonoid content, phenolic content, antioxidant, anti-inflammatory, cytotoxic, and cytoprotective effects. The first and second characteristics were computed using the colorimetric AlCl₃ and Folin-Ciocalteu colorimetric methods, respectively. The antioxidant characteristic was investigated against two reactive species, named hydroxyl and DPPH. Also, the total reducing power was calculated in this regard. The anti-inflammatory-reducing characteristics of the extracts were evaluated employing three inflammation-progressing enzymes. The last two characteristics were assessed using MTT-based methodology in two malignant and one healthy cellular population, respectively. The outcomes demonstrated that the extract of microwave-facilitation (Cr-1) has the highest flavonoid and phenolic contents, as well as the best antioxidant activity. Furthermore, when compared to the other one, Cr-1 showed a greater inhibitory effect on inflammation-progressing enzymes and selectivity against COX2. At the applied concentrations, neither extract, however, had any antiproliferative effect on malignant or healthy cellular lines. Moreover, the extracts had no additional influence on the ability of 5-fluorouracil (5-FU) to stop the proliferation of malignant cells. However, when the extracts were individually applied with 5-FU, the cytotoxic capability of the drug in healthy cellular populations was substantially lowered. Given these findings, the authors concluded that using Cr-1 together with 5-FU may serve as a measure of normal cellular protection.