

Title Studies on the dual antioxidant and antibacterial properties of parsley (*Petroselinum crispum*) and cilantro (*Coriandrum sativum*) extracts

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Abstract

Antioxidant and antibacterial activities of freeze-dried and irradiated parsley (*Petroselinum crispum*) and cilantro (*Coriandrum sativum*) leaves and stems were determined on methanol and water extracts. The total phenolic content was quantified with the Folin–Ciocalteu reagent. Several mechanisms of potential antioxidant activity of all extracts, including determining relative free radical-scavenging and ferrous ion-chelating activities, as well as reducing power, were examined. Assessment of the total antioxidant activity of all extracts was done using an iron-induced linoleic acid oxidation model system. Antimicrobial activity towards *Bacillus subtilis* and *Escherichia coli* by different extracts was assessed by determining cell damage. Total phenolic content varied between parsley and cilantro, leaf and stem, as well as methanol and water extracts. Methanol-derived leaf extracts exhibited significantly ($p < 0.05$) greater radical-scavenging activity towards both lipid- and water-soluble radicals, which was attributed to the total phenolic content. Ferrous ion-chelating activity was significantly ($p < 0.05$) greater in the stem methanol extracts, and corresponded to antioxidant activity. Prooxidant activity was a feature of all aqueous extracts and corresponded to the reducing activity of both leaf and stem parts of parsley and cilantro. Bacterial cell damage, resulting in significant ($p < 0.05$) greater growth inhibition of *B. subtilis* and *E. coli*, corresponded to ferrous sequestering activity of methanol-derived stem extracts.