Original Article

Total Phenolic Content, Antioxidant and Antibacterial Activities of Three Verbascum Species from Iran

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Abstract

The genus Verbascum L. belongs to the family Scrophulariaceae and includes plants that have been used widely in traditional medicine for a long time. Methanolic extracts of three Verbascum species from flora of Iran were in vitro screened for their possible antioxidant activities by three complementary test systems, namely DPPH free radical-scavenging, metal chelating activity and β-carotene/linoleic acid. The total phenol and flavonoid contents of the methanolic extracts from the aerial parts were measured by Folin Ciocalteu and AlCl₃ assays, respectively. In addition, antibacterial activities of the methanolic extracts were studied by disc diffusion method against 3 Gram positive and Gram negative bacteria. Results showed that the methanolic extract of V. sinuatum contains the highest amount of phenolic compounds and of V. speciosum represents the highest flavonoid content. Results from antioxidant activity assays showed that the studied extracts are more active than ascorbic acid as a synthetic antioxidant in DPPH radical scavenging assay, but represent lower activity in metal-chelating assay. In β-carotene/linoleic acid system, oxidation of linoleic acid was effectively inhibited by V. speciosum extract (58.4±18.1mg/g), followed by V. sinuatum (51.41±2.28 mg/g). In addition, methanolic extracts of three Verbascum species showed strong antibacterial activity against all tested bacteria.

Key words: Antibacterial activity, Antioxidant property, Flavonoids, Phenols, Verbascum