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Antimicrobial and antioxidant activity and composition of the essential oils from aerial parts of *Anthemis mirheydari* Iranshahr growing in Iran

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Background and Aims: Thirty-nine species of genus Anthemis (Compositae) are found in Iran but only a few reports on chemical and biological analysis of essential oils of Anthemis have been published. In this study the chemical composition and antimicrobial and antioxidant activity of the essential oils obtained from the aerial parts of Anthemis mirheydari Iranshahr were carried out.
Methods: The oil was obtained by water-distillation and was analysed by GC and GC/MS. Antibacterial activity by disc diffusion method and minimum inhibitory concentration (MIC) at different oil dilutions were screened against Gram positive and Gram negative bacteria, and fungi. The antioxidant activities of the oil was evaluated using ferric reducing antioxidant power (FRAP) and 2, 2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assays.
Results: Twenty-seven constituents, representing 96.30 % of the total components in the oil, have been identified in the essential oil. P-cymene (12/69), 1,8-cineole (12/61) and Caryophyllene oxide (9/10) were detected as the major components consisting 34.4% of the oil. The essential oil showed good antioxidant activities, (IC50 = 3.13±0.25 µg/ml) which correlated well with the total phenolic content (1.69± 0.10 mg catechin /g essential oil) of the oil (R2: 0.92, $p < 0.0001$). The plant oil inhibited moderately the growth of all tested bacteria and fungi. The oil proved to be active against 5 out of the 6 bacterial strains used and was particularly active against E. coli, P. aeroginosa, B. pumilus and S. typhi (MIC values of 8 µg/ml for the first and 16 µg/ml for the others, respectively).
Conclusions: The results obtained indicate that A. miirheydari oil extract may become important in the obtainment of a noticeable source of compounds with health protective potential and pharmaceutical activity and phytotherapy.

Keywords: Essential oil; Antibacterial; Antioxidant; Anthemis mirhehradi