Chemical profiling and antiproliferative effect of essential oils of two Araucaria species cultivated in Egypt

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Abstract

Araucaria is a small genus of evergreen coniferous trees, widely used for ornamental and timber purposes. Araucaria species are rich in essential oils. In this study, the essential oils obtained from the foliage of Araucaria heterophylla (Salisb.) and Araucaria bidwillii Hook were analyzed using GC and GC/MS. Cytotoxicity of both essential oils was assessed on three human cancer cell lines using MTT assay. Twenty nine compounds were annotated in A. heterophylla essential oil, whereas forty three were identified in A. bidwillii accounting for 95.16% and 81.06% of the total volatile oil composition, respectively. α-Pinene (70.85%), D-limonene (4.26%) and germacrene D (2.99%) represented the major compounds in A. heterophylla. Beyerene (35.65%), transnerolidol (13.66%) and γ-elemene (6.09%) dominated in A. bidwillii. Both oils showed potent cytotoxicity against all tested cancer cell lines (Hep-G2, MCF-7 and Caco-2) exhibiting IC50 values of 0.70, 3.20 and 1.10 μg/ml for A. heterophylla; and 1.67, 1.10 and 1.32 μg/ml for A. bidwillii, respectively. Caspase-3 activation indicated that the cytotoxicity of A. bidwillii essential oil is mediated via caspase-dependent apoptosis. These findings suggest that the essential oils of A. heterophylla and A. bidwillii offer promising anticancer drug candidates pertaining to the synergistic effects of their individual components.

Industrial Crops & Products - 2018, March