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Growth inhibitory activity of biflavonoids and diterpenoids from the leaves of the Libyan Juniperus phoenicea against human cancer cells

Afaf Al Groshi,Hiba A. Jasim, Andrew R. Evans,

Fyaz M.D. Ismail, Nicola M. Dempster,Lutfun Nahar and *Satyajit D. Sarke

Centre for Natural Products Discovery, School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Liverpool, UK

***CORRESPONDING AUTHOR: s.sarker@ljmu.ac.uk**

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Abstract

Three biflavonoids [cupressuflavone (1), amentoflavone (2), and sumaflavone (3)], four diterpenoids [13-epi-cupressic acid (4), imbricatholic acid (5), 3-hydroxy-sandaracopimaric acid (6), and dehydroabietic acid (7)], and one lignan [β-peltatin methyl ether (8)] were isolated from the cytotoxic fractions of the extracts of the leaves of the Libyan Juniperus phoenicea L. The structures of these compounds were elucidated by spectroscopic means. Cytotoxicity of compounds 1–6 were assessed against the human lung cancer cell line A549 using the MTT assay. Compounds 1 and 3 showed cytotoxicity against the A549 cells (IC50 = 65 and 77 μM, respectively), whereas compound 2 did not show any activity. Diterpenes 4–6 exhibited weak cytotoxicity against the A549 cells with the IC50 values of 159, 263, and 223 μM, respectively. The cytotoxicity of each compound was compared with the anticancer drug, etoposide (IC50 = 61 μM). Cupressuflavone (1) was evaluated also for cytotoxicity against both the human PC3 cancer cell line and the normal prostate cell line (PNT2), and this compound revealed a high degree of cytotoxic selectivity towards the prostate cancer cells (PC3), with IC50 value of 19.9 μM, without any evidence of cytotoxicity towards the normal prostate cell line (PNT2).

Keywords: Biflavonoids, Cupressaceae, cytotoxicity, diterpenes, Juniperus phoenicea, MTT assay