Chemical and Biological Investigation of Fruit Volatile Oil of the Egyptian Platycladus Orientalis L

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Abstract

Objectives: To isolate the volatile oil from Platycladus orientalis fruits and evaluate its cytotoxicity against five human tumor cell lines. The antimicrobial activities of the oil were evaluated as well.

Methods: The volatile oil was hydrodistilled from P. orientalis fruits. The chemical composition of the volatile oil was monitored by GC/MS analysis. The cytotoxic activity of the oil against five human tumor cell lines was determined using sulforhodamine B assay at concentrations ranging from 1.00-10.00 μg/ml. The antimicrobial activity of the oil against sixteen microbial strains was tested using agar diffusion method.

Results: The tested oil showed very potent cytotoxic activities against lung carcinoma, brain tumor, breast carcinoma, and liver carcinoma (IC50 = 0.6, 0.7, 0.7 and 0.9 μg/ml, respectively), and a significant effect against cervix carcinoma (IC50 = 2.8 μg/ml). The oil had significant antibacterial effects against C. pseudotropicalis (35 mm) and R. minuta (25 mm) and E. coli (27 mm). The oil had moderate antifungal activities against B. allii (20mm), equal activities against A. niger and A. flavus (15 mm), and the least activity was against M. phasioli (13 mm).

GC/MS of the oil revealed that the monoterpenoids constituted the highest percentage of the oil composition (84.15%). The sesquiterpenes amounted to 15.78%, while diterpenes was found in a very low percentage (0.07%). The major compound was △-pinene (30.89%), followed by 4-terpineol (19.16%) and △-cedrol (9.28%).

Conclusion: There is a very potent cytotoxic activity of the oil against all tested human cell lines. The oil had also a significant antimicrobial activity and a moderate antifungal activity.

Key words: Platycladus orientalis, volatile oil, cytotoxic, antimicrobial, fruits.