Altitude impact on the chemical profile and biological activities of Satureja thymbra L. essential oil

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Abstract

Background: Several agricultural or environmental factors affect plantsô chemical and pharmacological properties.
Methods: In this study, the essential oil of Libyan Satureja thymbra was isolated from plants collected during two successive years at two different altitudes; Wasita (WEO) and Safsaf (SEO), 156 and 661 m above sea level, respectively.
Results: GC/MS allowed the identification of 21 and 23 compounds, respectively. Thymol prevailed in WEO (26.69%), while carvacrol prevailed in SEO (14.30%). Antimicrobial activity was tested by agar-well diffusion method, and MIC/MLC values were determined by broth dilution method. Values of MIC/MLC were 0.125/0.25 εg/ml for SEO against S. aureus, P. mirabilis and K. pneumonia and for WEO against B. subtilus. It was observed that plants growing at lower altitude in Wasita locality had better antifungal activity, while those growing at higher altitude at Safsaf locality had better antibacterial activity. Both essential oils had a better anthelmintic activity than the standard piperazine citrate against a tested earthworm. However, SEO oil had a significantly higher anthelmintic activity than WEO. Cytotoxicity of the oils tested using SRB assay on human breast cancer (MCF-7) and colon cancer cell lines (HCT-116) showed better
activity for SEO, especially against HCT-116 with IC50 2.45 Ñ 0.21 εg/ml.
Conclusions: Thus, altitude is an important factor that should be considered as it affected the yield, composition and
biology of the plant extracts."

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