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Essential oil from *Rhaponticum acaule* L. roots: Comparative study using HS-SPME/GC/GC–MS and hydrodistillation techniques

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Abstract The composition of essential oil extracted from *Rhaponticum acaule* L. roots growing wild in Algeria was studied by hydrodistillation (HD) and by Head-Space Solid Phase Micro-Extraction (HS-SPME). Quantitative but not qualitative differences have been found in the chemical composition of both analysed samples depending on the extraction method. However, the oil obtained from *R. acaule* roots shows that aliphatic alcohols were found to be the major class (69.2%), followed by the terpenes (5.5%), alkenes (5.2%) and alkynes (4.0%). In both cases the analysis were carried out using Gas Chromatography (GC) and Gas Chromatography–Mass Spectrometry (GC–MS). Our study shows that HS-SPME extraction could be considered as an alternative technique for the isolation of volatiles from plant. 25 components were identified in oil vs. 39 in the HS-SPME. However the oil composition of roots was mainly represented by a variety of aliphatic hydrocarbons (alcohols, aldehydes and ketones) and terpenes which are known for their antimicrobial activities.

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1. Introduction

For many years, secondary metabolism was virtually ignored. Today, the situation is different. The wide structural variability of these compounds has attracted the curiosity of chemists and the biological activities possessed by natural products have inspired the pharmaceutical industry to search for new structures.

In relation to pathogenic bacteria, a growing and worrisome problem is the increase in bacterial resistance to antibiotics (Nostro et al., 2004; Georgopapadakou, 2001). For patients, antimicrobial resistance increases morbidity and