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Chemical composition of essential oils of *Artemisia campestris* and *Juniperus phoenicea* from Algeria

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ABSTRACT: The chemical composition of the essential oils obtained by hydrodistillation from *Artemisia campestris* L (family Asteraceae) and *Juniperus phoenicea* L (family Cupressaceae) collected in Djebel Amour (Sahara Atlas, Algeria). Aerial parts were also evaluated by gas chromatography (GC) and gas chromatography coupled to mass spectrometry (GC-MS). The analyses for leaves and fruits of *A. campestris* resulted in the identification of thirty-one compounds, representing 91.8 % of the total oil and the yields were 0.33% (v/dry weight). The main components were β-pinene and sabinene (25.6% and 17% respectively) followed by α-pinene (9.9%), limonene (6.6 %) and p-cymene (4.1%). forty-two compounds were identified in leaves and fruits of *J. phoenicea* representing 97% of the total oil composition. The yield of essential oil was 0.44 % and the major compound in aerial parts was α-pinene (75.8%) followed by δ-3- carene (3.4%), linalool (2.7%).

KEYWORDS: *Artemisia campestris, Juniperus phoenicea,* Essential oil, GC-MS, Algeria.

1 INTRODUCTION

The genus *Artemisia*, widespread over the world, growing wild over the Northern Hemisphere belongs to the *Asteraceae* family. Eleven species of *Artemisia* can be found in Algerian flora [1]. *Artemisia campestris* L. In Arab folk medicine, A. *campestris* have been used as febrifuge, vermifuge, anticancer, against digestive troubles, gastric ulcer, and menstrual pain [2, 3]. Juniperus berries are used as the only spice derived from conifers, particularly in European cuisine [4, 5]. This species is also a medicinal plant largely used in traditional medicine. Leaves' decoction is used to treat diarrhea, rheumatism, diabetes, against bronco- pulmonary disease and as diuretic. The mixture of leaves and berries of this plant is used as an oral hypoglycaemic agent [6, 7]. In the light of this work we have determined and comparative the chemical composition of essential oils isolated from leaves and fruits of *A. campestris* and J*. phoenicea* from Algeria.

2 MATERIAL AND METHODS

The leaves and fruits of A. *campestris* and J. *phoenicea* have been collected during April 2010 grow in the full steppe zone of Algeria named Djebel Amour region (Sahara Atlas).The essential oils of each collective sample were isolated from fresh plant material (30 g) by hydrodistillation, for 4 h, using a Clevenger-type apparatus according to the European Pharmacopoeia method (Council of Europe, 2007). Gas chromatographic analyses were performed using a Perkin Elmer Autosystem XL gas chromatograph equipped with two flame ionization detectors (FIDs) as reported by [8]. The GC-MS unit consisted on a Perkin Elmer Autosystem XL gas chromatograph, equipped with DB-1 fused-silica column (30 m x 0.25 mm i.d.,

film thickness 0.25 µm; J & W Scientific, Inc.), and interfaced with a Perkin-Elmer Turbomass mass spectrometer (software version 4.1, Perkin Elmer, Shelton, CT, USA) The conditions of the assay are those previously reported . The identity of the components was assigned by comparison of their retention indices, relative to C8-C17 n-alkanes, and GC-MS spectra with corresponding data of components of reference oils, laboratory synthesized components and commercially available standards from a home-made library.

3 RESULTS AND DISCUSSION

The chemical composition of essential oils of *Artemesia campestris* and *Juniperus Phoenicea* are presented in Table 1. More than 50% of the essential oil of A. campestris was constituted by β-pinene, sabinene and α-pinene, whereas in *J. phoenicea* oil only one component (α-pinene) constituted more than 75% of the oil (Table 1). The chemical composition of A. campestris oils from Europe, Africa and Asia has been reported and some variability has been found which can be attributed to the seasonal and climatic and geographical conditions among areas. α-pinene richness of Juniperus oil was already reported by other authors [9-11].

Table 1. Composition of the essential oils isolated from the aerial parts of A. campestris L and. J. phoenicea populations collected in Laghouat, Algeria

Components	RI	A. *campestris*	J. *phoenicea*
α-Pinene	**930**	**9,9**	**75,8**
Sabinene	**958**	**17**	t
β-Pinene	**963**	**25,6**	t
β-Myrcene	975	3,3	1,2
δ-3-Carene	**1000**		**3,4**
p-Cymene	1001	4,1	0,3
Limonene	**1009**	**6,6**	0,7
γ-Terpinene	1035	2,3	0,2
Linalool	1074	1,3	2,7
Terpinen-4-ol	1148	2	0,2
α-Terpineol	1159	1,1	0,5
Geraniol	1236	1,3	
Geranyl acetate	1370	1,3	
Germacrene-B	1533		0,5
Spathulenol	1551	2,5	
Geranyl isovalerate	1590	1,6	
β-Eudesmol	1620	3,6	
% of identification		91,8	97
Grouped components			
Monoterpene hydrocarbons		73,9	83,2
Oxygen-containing monoterpenes		10,6	8,9
Sesquiterpene hydrocarbons		1,2	3,2
Oxygen-containing sesquiterpenes		6,1	0,6
Others		t	1,1

RI: retention index relative to C9-C17 n-alcanes on the DB-1 colum ; t: trace (<0.05%).

4 CONCLUSION

The leaves and fruits oils obtained from *Artemesia campestris* and *Juniperus phoenicea* grown in Algeria was characterized by GC-MS, GC-FID and thirty-one volatile compounds were identified which made up 91.8% of the total essential oil of *A. campestris* and *forty-two* volatile compounds were identified which made up 97% of the total volatile products for *J. phoenicea*. k The essential oil yields of the studies were 0.33% and 0.44% for *A.campestris* and *J.phoenicea* respectively. The major constituent in aerial parts was α-pinene (75.8%).

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