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CHEMICAL COMPOSITION OF THE ESSENTIAL OIL OF *Rosmarinus officinalis* CULTIVATED IN THE ALGERIAN SAHARA

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The volatile compounds obtained by hydrodistillation of the aerial parts of Rosmarinus officinalis *cultivated at the Algerian Sahara were analyzed by GC/MS. Thirty compounds were characterized representing 98.2% of the essential oil with 1,8-cineole (29.5%), 2-ethyl-4,5-dimethylphenol (12.0%) and camphor (11.5%) as the major components.*

Key words: *Rosmarinus officinalis,* essential oil, GC/MS.

Rosmarinus is one of the oldest known medicinal plants in Algeria. It is used as an antispasmolytic and as a flavor and fragrance ingredient in the food.

We identified 30 compounds in the hydrodistilled oil of *Rosmarinus officinalis*, cultivated at Oued Souf (Algerian Sahara), with 1,8-cineole (29.5%), 2-ethyl-4,5-dimethylphenol (12.0%), camphor (11.5%), borneol (9.4%), (+)-α-terpineol (9.2%), α-pinene (7.5%), and camphene (5%) as the main components (Table 1). These results are in agreement with the reported essential oils of Italian *R. officinalis* [1] mainly composed of 1,8-cineole (43.3%), α-pinene (18.6%), borneol (8.96%), β-pinene (6.79%), (+)-α-terpineol (3.59%), and the Spanish species [2] mainly represented by camphor (40.85%), 1,8-cineole (12.20%), and borneol (7.62%).

EXPERIMENTAL

GC analyses were performed using a Perkin–Elmer gas chromatograph equipped with two FID, a data handling system, and a vaporizing injector port into which two columns of different polarities were installed: a DB-1 fused silica column (30 m $\times$ 0.25 mm i.d., film thickness 0.25 mm) and a DB-Wax fused silica column (30 m $\times$ 0.25 mm i.d., film thickness 0.25 mm). Oven temperature was programmed, 45–175°C at 3°C min^{-1}, subsequently at 15°C min^{-1} up to 300°C, and then held isothermal (15 min); carrier gas, He at 30 cm/min. GC chiral analyses were performed using a Perkin–Elmer gas chromatograph equipped with a FID, a data handling system, a Cyclodex-B fused-silica column (30 m $\times$ 0.25 mm i.d., film thickness 0.25 mm), and a DB-Wax fused silica column (30 m $\times$ 0.25 mm i.d., film thickness 0.25 mm). Oven temperature was 75°C, isothermal, injector and detector temperatures, 230°C and 240°C, respectively; carrier gas, He at 42 cm/min.

GC-MS analyses were performed on a Perkin–Elmer apparatus equipped with a DB-1 fused silica column (30 m $\times$ 0.25 mm i.d., film thickness 0.25 mm) and interfaced with an ion trap detector (ITD; software 4.1). Injector temperature MS operating parameters were as follows: ion trap temperature, 220°C; split ratio1:40; ionization potential, 70 eV; ionization current, 60 mA; scan range, 40–300 a.m.u, scan time, 1 s.

Identification of components was done by comparison of the retention indices (RI) relative to C_9–C_{17} *n*-alkanes and MS with the corresponding database (NIST library) and with mass spectral literature [3–5]. Relative percentage amounts of the identified components were calculated from the total ion chromatograms by a computerized integrator.

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TABLE 1. Composition of the Essential Oil of *Rosmarinus officinalis*

Compound	Percentage	RRI*	Compound	Percentage	RRI*
α-Thujene	0.1	924	(D)-Verbenone	0.1	1170
α-Pinene	7.5	930	Bornylacetate	3.0	1180
Camphene	5.0	938	Thymol	0.2	1275
β-Pinene	3.2	963	2-Ethyl-4,5-Dimethylphenol	12.0	1305
2,7-Dimethylocta-2,6-dienol	4.0	1009	2-Tridecane	0.2	1318
1,8-Cineole	29.5	1015	Eugenol	0.1	1327
γ-Terpinene	0.1	1035	β-Caryophyllene	0.1	1414
trans-Sabine hydrate	0.4	1037	Germacrene D	0.1	1474
Fenchol	0.2	1065	β-Caryophyllene oxide	0.1	1581
Camphor	11.5	1095	Isoaromadendrene epoxide	0.7	1590
Borneol	9.4	1134	Alloaromadendrene oxide	1.4	1595
Cryptone	0.1	1148	α-Bisabolol	0.4	1656
α-Terpinenol	9.2	1159			

*Relative Retention Indices calculated against *n*-alkanes.

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