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RESEARCH REPORT

Uruguayan Essential Oils. Part VIII. Composition of Leaf Oil of *Hyptis floribunda* Briq. ex Micheli (Labiatae)

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Abstract

Hyptis floribunda leaf oil, obtained by hydrodistillation, was analyzed by GC and GC/MS. Forty-three components were identified in the oil. The main components were germacrene B (40.2%), β-caryophyllene (9.9%), germacrene D (9.8%) and α-copaene (8.0%).

Key Word Index

Hyptis floribunda, Labiatae, essential oil composition, germacrene B.

Introduction

Hyptis floribunda is a herbaceous, perennial plant, which can reach 3 meters in height. It blooms from January to February, and its flowers show a color from pinkish-white to pale lilac. This plant grows spontaneously on sandy soil near the sea or near a water-course. It is widespread in Uruguay, Paraguay, Brazil and Argentina (1). The composition of leaf oil of *H. floribunda* is reported in this paper. There are no previous references on the oil composition in the literature.

Experimental

The fresh leaves of *Hyptis floribunda* were collected, on the seaside of Pajas Blancas, Montevideo Department, Uruguay, in January 1996. Voucher specimens (MVFQ 3492) have been preserved in the Herbarium of Institute of Botanica, Faculty of Chemistry, University of Montevideo, Uruguay. The leaves were air-dried and the oil was isolated by hydrodistillation in a modified Clevenger-type apparatus. The *H. floribunda* leaf oil was analyzed by GC and GC/MS.

GC: Fisons chromatograph 5160 Mega Series equipped with a Shimadzu data processor C-R 3A; silica fused capillary column, 25 m x 0.32 mm, coated with SE-52, 0.40-0.45 μm film thickness (Mega, Legnano, Italy); column temperature, 45°C (6 min) to 240°C at 3°C/min; injector temperature 250°C; detector temperature 280°C; injection mode, split; split ratio 1:50; volume injected, 0.2 mL of the oil; carrier gas, He, 100 KPa.

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Table I. Chemical composition of *Hyptis floribunda* oil

Peak no.	Compound	Percentage	Peak no.	Compound	Percentage
1	α-pinene	2.3	27	germacrene D	9.8
2	sabinene	t	28	β-selinene	0.7
3	1-octen-3-ol	t	29	α-selinene	0.9
4	3-octanol	t	30	germacrene A	2.1
5	myrcene	t	31	7-epi-α-selinene	0.5
6	limonene	0.1	32	δ-cadinene	3.3
7	benzyl alcohol	0.1	33	α-calacorene	0.5
8	linalool	0.3	34	(Z)-nerolidol	1.4
9	2-phenylethyl alcohol	t	35	elemol	0.4
10	δ-elemene	0.7	36	germacrene B	40.2
11	α-cubebene	0.3	37	(E)-nerolidol	0.1
12	eugenol	0.3	38	caryophyllene oxide	0.4
13	α-copaene	8.0	39	selin-11-en-4α-ol	0.2
14	β-bourbonene	4.1	40	14-hydroxy-9-epi-β-caryophyllene	0.1
15	β-cubebene	t	41	tetradecanol	0.1
16	β-elemene	3.0	42	caryophyllene acetate	0.1
17	methyl eugenol	0.1	43	cedroxide	0.2
18	β-caryophyllene	9.9			
19	cis-thujopsene	0.1		Monoterpenes	2.4
20	β-gurjunene	0.6		Sesquiterpenes	91.0
21	γ-elemene	3.8		Hydrocarbons	93.4
22	aromadendrene	0.3		Alcohols	2.7
23	α-humulene	1.1		Ethers and oxides	1.0
24	9-epi-β-caryophyllene	0.4		Oxygenated compounds	3.8
25	α-himachalene	0.3		Total	97.2
26	γ-muurolene	0.4			

GC/MS: Shimadzu QP 5000 equipped with Adams library (2), silica fused capillary column, 30 m x 0.25 mm coated with DB-5, 0.25 μm film thickness (J & W, Folson, California, USA); column temperature, 60°C to 240°C at 3°C/min; injector temperature, 250°C; injection mode, split; split ratio, 1:30; volume injected, 0.2 mL of the oil; carrier gas He, 61.6 KPa; linear velocity 33.5 mL/min; interface temperature 250°C; detector 1.5 kV; acquisition mass range 41-300; solvent cut, 2 min.

Results and Discussion

H. floribunda oil is pale yellow and its odor resembles that of tea leaves. Table I gives the relative percentages of single components and classes of compounds of *H. floribunda* oil, while Figure 1 shows the chromatogram of this oil. Figure 1 and Table I show the presence of 43 identified components that represents the 96.83% of the whole oil.

Sesquiterpene hydrocarbons represent more than 90% of the whole oil. Germacrene B (40.2%), β-caryophyllene (9.9%), germacrene D (9.8%) and α-copaene (8.0%) were the main components. Monoterpene hydrocarbons were represented only by α-pinene (2.3%), limonene (0.1%) and trace amount of sabinene and myrcene, while linalool (0.3%), eugenol (0.3%) and methyl eugenol (0.1%) were the only oxygenated monoterpene compounds present. The oil also contained 1.9% of sesquiterpene alcohols, 0.6% of sesquiterpene oxides and small amounts (0.1%) of caryophyllene acetate.

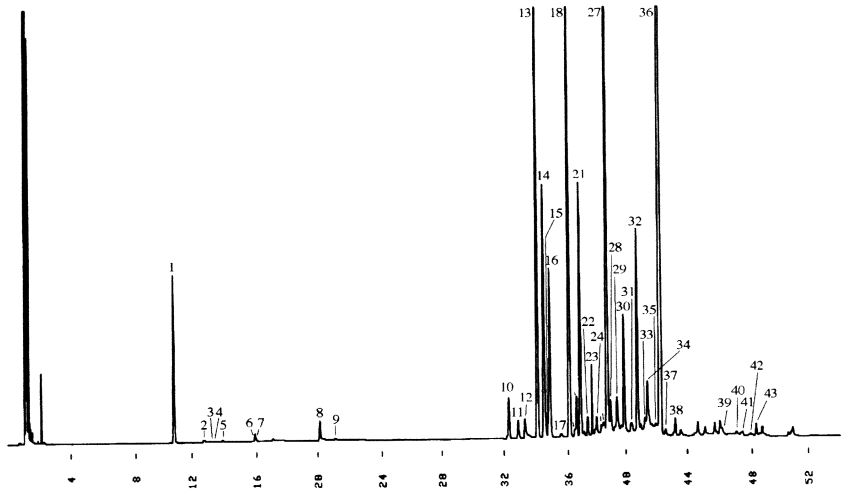

Figure 1. GC chromatogram of *Hyptis floribunda* leaf oil. For peak identifications, see Table I

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