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Volatile Constituents of *Hyptis crenata* Pohl (Labiatae) Native in Brazilian Pantanal

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Abstract

Fifteen compounds were identified in the essential oil of *Hyptis crenata* Pohl, which was analyzed by GC/MS. The main oil components were α-pinene (15.5%), β-pinene (10.5%), camphor (17.3%), and β-caryophyllene (10.7%). The volatile concetrate isolated from the distillation water contained 1,8-cineole (11.9%), camphor (37.3%) and β-caryophyllene (14.7%).

Key word Index

Hyptis crenata, Labiatae, essential oil composition, α-pinene, β-pinene, camphor, β-caryophyllene.

Introduction

Hyptis crenata Pohl, known as "hortelã-brava" (wild peppermint) is a Brazilian subshrub, 0.3 to 0.8 m tall. It smells minty and flourishes nearly year round, where it inhabits the Amazon, Pantanal wetland and Minas Gerais state, in Brazil. Medicinally it is utilized by people for respiratory disorders and to kill human worms. The leaves are rubbed on the skin to repel insects (1).

Some of the species of *Hyptis* have been studied from the chemical point of view (2-11), and the main compounds identified were mono- and sesquiterpenoid compounds such as camphor, 1,8-cineole, α-pinene, borneol, trans-dihydrocarvone; β-caryophyllene, germacrene B and germacrene D. Eugenol was also identified in a high amount in one of the samples (3).

Some biological activity of *Hyptis* oils has been reported. For example, the oil of *H. suaveolens* was shown to possess nematicidal activity (12) and to protect stored grains against insects (13). *H. spicigera* was found to be active against phytopathogenic fungi (14). Also, a chloroform extract of *H. verticillata* demonstrated cytotoxic activity (15), whereas its isolated compounds were found to have acaricidal and insecticidal properties (16), and antiinflamatory activity (17).

To the best of our knowledge, *H. crenata* has not been the subject of previous study. In this report we present the first study on the oil obtained from the aerial parts of *H. crenata* collected in the Brazilian Pantanal.

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Table I. Percentage composition of the *Hyptis crenata* oils

Components*	EO_1	EO_2	Total**	RI	Identification method
α-pinene	15.5	1.2	6.9	923	a, b, c
camphene	2.7	-	1.1	934	a, b, c
β-pinene	10.5	-	4.2	-	a, b, c
myrcene	2.1	t	0.8	980*	a, b, c
δ-3-carene	0.4	-	0.2	1005	a, b
p-cymene	2.8	0.4	1.4	1006	a, b, c
1,8-cineole	8.7	11.9	10.6	1012	a, b, c
limonene	6.3	1.1	3.2	1015	a, b, c
γ-terpinene	3.5	1.0	2.0	1042	a, b, c
terpinolene	1.0	t	0.4	1088*	a, b, c
camphor	17.3	37.3	29.3	1110	a, b, c
isoborneol	t	1.6	1.0	1137*	b
terpinen-4-ol	t	0.8	0.5	1150	a,b
α-terpineol	0.6	4.2	2.8	1163	a, b, c
β-caryophyllene	10.7	14.7	13.1	1397	a, b, c

a = GC/MS library search; b = MS.Lit(18,19); c = co-injection with authentic sample
t = trace (< 0.4%); *R.I. Lit. (18); **Total [(HC_1+HC_2x1.5) / 2.5];
***Components are listed according to their elution on DB-5 capillary column

Experimental

Plant Material: Plant material was collected in Mato Grosso do Sul state, Brazil, in April 1996, at flowering stage, and a voucher specimen was deposited in the CPAP herbarium, number AP 4304.

The oil EO_1 (1 mL) was obtained by hydrodistillation of 1,200 kg the fresh material in Clevenger-type apparatus, for 8 h. After the separation of the oil, the aqueous layer was extracted with diethyl ether to yield 1.5 mL of oil (EO_2). Both oils were analyzed.

Analysis: The GC/MS analysis was carried out in a Shimadzu model QP- 5000, equipped with an electron impact (70 eV) detector, and a 25 mm x 0.25 mm, fused silica capillary column (DB-5). The carrier gas was Helium (1.7 mL/min) The programmed temperature was: 50º-160ºC at 2ºC/min followed by 160º-240ºC at 10ºC/min. Injector temperature was 240ºC and detector temperature, 230ºC. Components were identified by comparison of their mass spectra and the retention indices with those of reference compounds and by co-injection of authentic samples.

Results and Discussion

The compounds identified in the separated oil (EO_1) are shown in Table I. The aqueous layer resulting from hydrodistillation, even after the separation of oil, possessed a strong aroma, and was extracted with diethyl ether. After elimination of the ether, the oil yielded 1.5 mL and was analyzed by GC/MS. The components of this volatile isolate from the distillation water are listed in Table I as EO_2. The total amount of the components of the oils was calculated considering the volume of each (EO_1 = 1 mL; EO_2 = 1.5 mL).

As in other species of *Hyptis*, the oil of *H. crenata* was characterized by its richness in monoterpenes.

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