J. Essent. Oil Res., **17**, 499-500 (September/October 2005)

Essential Oils from Leaves of Two *Eugenia brasiliensis* Specimens from Southeastern Brazil

Dominique C.H. Fischer
Faculdade de Ciências Farmacêuticas, Universidade de São Paulo, C.P. 66083, 05389-970, São Paulo, SP, Brazil

Renata P. Limberger and Amélia T. Henriques
Programa de Pós-Graduação em Ciências Farmacêuticas, Faculdade de Farmácia, UFRGS Av. Ipiranga 2752, 90.610-000, Porto Alegre, RS, Brazil

Paulo R.H. Moreno*
Instituto de Química, Universidade de São Paulo, Av. Prof. Lineu Prestes 748 , 05585—900 São Paulo, SP-Brazil

Abstract

The essential oils from leaves of two specimens of *Eugenia brasiliensis* collected at two locations in the southeastern Brazilian cerrado were analyzed by GC and GC/MS. The main constituents found in the leaf oil from both specimens were α- and β-selinene and β-caryophyllene. The specimen collected at Jaboticabal contained β-selinene (17.3%) as the major component, while the specimen from Martinho Prado contained α-selinene (14.8%) as the major compound. Additionally, the specimen from Martinho Prado produced relatively high amounts of α- and β-pinene (6.6% and 3.6 %, respectively).

Key Word Index

Eugenia brasiliensis, Myrtaceae, essential oil composition, α-selinene, β-selinene, β-caryophyllene.

Introduction

The *Eugenia* genus is one of the largest within the Myrtaceae family. In Brazil, there are 350 native species from this genus (1). Several *Eugenia* species are appreciated for their edible fruits; such as *E. uniflora* (pitanga) and *E. involucrata* (cherry) and some are also used in folk medicine as antidiarrheic (*E. uniflora*) and antidiabetic (*E. jambolana*) (2).

Eugenia brasiliensis Lam. is a tree found in the coastal Brazilian forests commonly known as Grumixama or Brazilian-cherry. The essential oil composition has previously been investigated in specimens collected in southern Brazil (3,4). In these specimens, the main components were α- and β-pinene (10.3% and 10.4%, respectively), spathulenol (7.7%) and τ-cadinol (7.1%).

In this paper we report the chemical composition of the volatile oil from two specimens of *E. brasiliensis* growing in southeastern Brazil in a region known as Cerrado.

Experimental

Plant material: The leaves of *Eugenia brasiliensis* Lam. were collected at the Experimental Reserve of the Botanical Institute of São Paulo, Martinho Prado (SP) in October 2000 and at the Campus of UNESP, Jaboticabal (SP) in October 1999. Voucher specimens (331554 SP and Fischer 13) were identified by Lúcia Kawasaki and deposited at the Herbário do Instituto Botânico de São Paulo.

The oils were obtained from leaves by hydrodistillation for 5 h using a Clevenger-type apparatus. The oil from the Jaboticabal specimen had a yield of 0.3% and the one from Martinho Prado 0.17%.

GC: GC analysis was performed in a chromatograph (Shimadzu GC-17A) equipped with Shimadzu GC 10 software, using a fused silica capillary column (30 m x 0.25 mm x 0.25 μm, coated with DB-5), and a flame ionization detector. Injector and detector temperatures were set at 220°C and 250°C, respectively; the oven temperature was programmed from 60°-300°C at 3°C/min and helium was employed as carrier gas (1 mL/min). The percentage compositions were obtained from electronic integration measurements using flame ionization detection without taking into account relative response factors.

CG/MS: The sample was analyzed by GC/MS, using a Shimadzu capillary GC-quadrupole MS system (QP 5000) operating at 70 eV in the same conditions as described above. The identification of the compounds was performed by comparing retention indices (determined relatively to the retention times of a series of *n*-alkanes) and mass spectra with those of authentic samples authentic and with literature data (5,6).

*Address for correspondence

Received: December 2002
Accepted: February 2003

1041-2905/05/0005-0499$6.00/0—

Table I. Chemical composition of the leaf oil of *Eugenia brasiliensis* collected at Martinho Prado (1) and Jaboticabal (2)

Constituents	RI(DB5)	1 %	2 %	Constituents	RI(DB5)	1 %	2 %
octane	791	0.1	-	γ-cadinene	1499	2.5	3.1
ethyl acetate	800	0.3	0.3	7-epi-α-selinene	1503	0.4	0.3
α-pinene	923	6.6	0.7	δ-cadinene	1509	4.8	-
β-pinene	964	3.6	0.4	α-cadinene	1522	0.4	-
myrcene	977	1.0	-	spathulenol	1561	4.0	6.3
limonene	1016	0.7	0.4	caryophyllene oxide	1567	3.0	7.0
1,8-cineole	1019	3.9	3.4	epi-globulol	1574	1.1	0.9
terpinen-4-ol	1159	-	0.3	eudesmol	1583	0.6	0.5
α-terpineol	1172	1.1	1.8	humulene oxide II	1593	0.8	0.8
α-copaene	1357	1.6	2.2	10-epi-γ-eudesmol	1602	0.5	-
β-bourbonene	1365	0.8	1.1	γ-eudesmol	1612	0.6	0.6
β-elemene	1373	3.6	4.6	τ-cadinol	1623	1.9	1.9
α-gurjunene	1390	0.3	-	β-eudesmol	1633	0.5	0.5
β-caryophyllene	1401	12.6	8.7	α-cadinol	1638	3.6	3.9
β-gurjunene	1421	3.2	4.2	ocidentalol acetate	1661	--	0.6
aromadendrene	1425	0.5	0.5				
α-humulene	1436	2.0	1.7	Total		99.7	93.8
allo-aromadendrene	1443	1.6	1.9	Aliphatic compounds		0.4	0.3
drima-7,9(11)-diene	1453	-	0.3	Monoterpene hydrocarbons		11.9	1.5
γ-muurolene	1459	2.8	3.5	Oxygenated monoterpenes		14.9	5.5
β-selinene	1472	12.6	17.3	Sesquiterpene hydrocarbons		65.1	63.5
α-selinene	1483	14.8	13.3	Oxygenated sequiterpenes		16.1	23.0
α-muurelene	1485	0.6	0.8				

Results and Discussion

The results of the chromatographic analysis of the oils from both specimens are presented in Table I. Altogether 38 compounds were identified, accounting for the range 93.8-99.7%. Both specimens were collected in the "Brazilian Cerrado" (a savannah-like region), which is a unique biome.

The analysis showed that for both specimens, the majority of the identified compounds were sesquiterpene hydrocarbons, 65.1% in the Martinho Prado specimen and 63.5% in the one collected at Jaboticabal. The main difference observed among the specimens was the relatively high amount of monoterpenes, hydrocarbons and oxygenated, in the Martinho Prado specimen. A previous study performed with a specimen collected at Blumenau (southern Brazil) also detected high amounts of monoterpenes (3,4).

References

1. L. R. Landrum and M.L. Kawasaki, *The genera of Myrtaceae in Brazil: an illustrated synoptic treatment and identification keys.* Brittonia, **49**, 508-536 (1997).
2. M. Pio Correa, *Dicionário das Plantas Úteis do Brasil e das Exóticas Cultivadas. Imprensa Nacional.* Rio de Janeiro, **5**, 512 (1984)
3. P.Vérin, *Étude Chimique des Constitutants Volatils de Plantes Aromatiques du Brésil.* Ph. D. Thesis, Université de Montpellier II, Monpellier (1996).
4. M. A. Apel, M. Sobral, C. Menut, J.-M. Bessiere, E.E.S. Schapoval and A. T. Henriques, *Essential oils from Eugenia species. Part VII: sections Phyllocalyx and Stenocalyx.* J. Essent. Oil Res., **16**, 135-138 (2004).
5. R. P. Adams, *Identification of essential oil components by gas chromatography/ ion trap mass spectrometry.* Allured Pub., Carol Stream, IL (1995).
6. W. Jennings and T. Shibamoto, *Qualitative analysis of flavor and fragrance volatiles by glass capillary gas chromatography.* Academic Press, New York (1980).