

Volume 8 Number 2
August, 2005

ISSN 0972-060X

Journal of Essential Oil Bearing Plants



The Journal devoted to the promotion of research on Essential Oil



Aromatic Plants of Yungas, Part V. Essential Oils Composition of *Polystichum Montevidense* (Spreng.) Rosenst. (Dryopteridaceae) and *Podocarpus Parlatoresii* Pilg. (Podocarpaceae)

Labucka Diana, O¹., Lopez Maria, L¹., Gurvich Diego, E¹., Martini Carolina¹,
 *Zygodlo Julio, A¹., Rotman Alicia² and Ahumada Osvaldo²

¹Catedra de Quimica Organica, Facultad de Ciencias Exactas, Fisicas y Naturales,
 Universidad Nacional de Cordoba. IMBIV-CONICET, Argentina

²Catedra de Botanica General-Herbario JUA, Facultad de Ciencias Agrarias,
 Universidad Nacional de Jujuy, Argentina

Abstract: The essential oils of *Polystichum montevidense* (Spreng.) Rosenst. (Dryopteridaceae) and *Podocarpus parlatoresii* Pilg. (Podocarpaceae) were analyzed for the first time by means of GC and GC-MS. From *Polystichum montevidense* sixteen compounds were identified, representing 98.0% of the oil, whereas *Podocarpus parlatoresii* seventeen compounds were identified, representing 97.7% of the oil. *Polystichum montevidense* contained higher amounts of α -pinene (21.3%), α -terpinol (14.8%), pulegone (14.7%), and α -muurolene (10.2%), whereas the major oil constituents of *Podocarpus parlatoresii* were found to be terpinen-4-ol (29.0%), germacrene D (17.7%) and α -eudesmol (16.5%).

Key words: *Podocarpus parlatoresii*, *Podocarpus parlatoresii*, essential oil composition, α -pinene, α -terpinol, pulegone, α -muurolene, terpinen-4-ol, germacrene D, α -eudesmol.

Introduction: *Polystichum montevidense* (Spreng.) Rosenst. "ala de cuervo" is an medicinal fern native to Yungas (Argentina). A hot bath with *P. montevidense* is recommended at least once a week during the last weeks of pregnancy, if some ailments appear. *Podocarpus parlatoresii* Pilg. is an aromatic tree "pino del cerro" and it is often used simply as a pleasant flavor in mixture of tea by local people. The composition of essential oil from these species growing in Yungas, Argentina is not known and therefore investigated.

Experimental

Plant material: Aerial parts of the plants of *Polystichum montevidense* (Spreng.)

*Corresponding Author: (Zygodlo Julio, A)

E-mail: <juliozyg@yahoo.com.ar>

Rosenst. (Dryopteridaceae) and *Podocarpus parlatoresi* Pilg. (Podocarpaceae) were collected from Tiraxi, Jujuy Province, in northwest Yungas. Voucher specimens are kept at the JUA, Herbarium Facultad de Ciencias Agrarias, Jujuy, Argentina (Rotman 1352 and Rotman 1347 respectively).

Extraction of essential oils: Dried leaves of *Polystichum montevidense* and *Podocarpus parlatoresi* were hydrodistilled in a Clevenger-like apparatus to yield 0.1% and 0.2% oil, respectively. The oils obtained were dried over anhydrous sodium sulphate and stored in a refrigerator until analysis.

Gas Chromatography analyses: GC analyses were performed in a Shimadzu GC-R1A (FID) gas-chromatograph, fitted with (30m x 0.25mm film thickness 0.25 μ m) fused silica capillary columns coated with a non polar DB-5 (phase 5% phenyl 95% dimethylpolysiloxane) or with a polar Supelcowax 10 phase (Polyethyleneglycol). The GC operating conditions were: oven temperature programmed from 40-230°C at 2°C / min, injector and detector temperatures 240°C. The carrier gas was nitrogen at a constant flow of 0.9 ml / min.

GC-MS analyses were performed with a Perkin Elmer Q-700 equipped with an apolar SE-30 capillary column (30m x 0.25mm film thickness 0.25 μ m), 100% dimethylpolysiloxane. The operating conditions were: oven temperature programmed from 40-230°C at 2°C / min, carrier gas was helium at a constant flow of 0.9 ml / min. source at 70 eV.

The constituents of the essential oils were identified on the basis of their GC retention indices (RI) with reference to a homologous series of n-alkanes (C₁₂-C₂₅), by comparison of their retention times with those of pure authentic samples from Sigma, Fluka and Palma Companies, peak enrichment on co-injection with authentic standards wherever possible, by GC-MS library search (Nist) and using visual inspection of the mass spectra from literature² for confirmation.

Results: In our analysis, 16 components were identified in *Polystichum montevidense* representing 98.0% of the total oils (Table 1.). The major components were hydrocarbons terpenes such as α -pinene, α -muurolene and γ -cadinene and oxygenated monoterpenes such as α -terpineol, pulegone and 1,8-cineole.

The oil of *Podocarpus parlatoresi* under analysis was characterized as being rich in a dominant alcohol monoterpene, terpinen-4-ol, and two hydrocarbons sesquiterpenes: germacrene D and α -eudesmol (Table 1.)

Acknowledgments: This research supported by funds from PROYUNGAS, CONICET and SECyT-UNC grants.

References

1. Hilgert, N. I. (2001). Plants used in home medicine in the Zenta River basin, north west Argentina. J. Ethnopharmacology 76: 11-34.
2. Adams, R. P. (1989). Identification of essential oils by ion trap mass spectroscopy. Academic Press, London.

Table 1. Composition of the essential oil of *Polystichum montevidense* and *Podocarpus parlatorei* from Yungas

Components	<i>P. montevidense</i>	<i>P. parlatorei</i>	Retention Index		Identification methods
			DB-5	Supelcowax 10	
α -Pinene	21.3	-	939	-	Co-MS
Limonene	-	2.8	1031	1209	Co-MS
1,8-Cineole	6.6	-	1033	1234	Co-MS
β -Terpineol (E)	-	0.6	1120	-	MS
cis-p-Menth-2-en-1-ol	-	1.7	1126	1663	MS
β -Terpineol (Z)	-	0.7	1133	-	MS
Terpinen-4-ol	-	29.0	1177	1605	Co-MS
α -Terpineol	14.8	2.0	1190	1715	Co-MS
Pulegone	14.7	-	1239	1464	MS
Geraniol	-	0.7	1256	-	MS
Bornyl acetate	-	0.8	1285	-	MS
δ -Elemene	-	3.5	1342	-	MS
α -Cubebene	-	1.0	1358	-	MS
β -Cubebene	1.4	-	1387	-	MS
β -Elemene	-	5.2	1394	-	MS
Longifolene	1.8	-	1404	-	MS
β -Caryophyllene	1.1	-	1419	-	MS
α -Ionone	0.5	-	1426	-	MS
α -Humulene	3.3	-	1452	1678	MS
β -Ionone	0.5	-	1465	-	MS
Germacrene D	3.1	17.7	1480	1706	MS
α -Muurolene	10.2	-	1499	1735	MS
γ -Cadinene	8.3	-	1510	1765	MS
δ -Cadinene	6.1	4.5	1524	1744	MS

table 1. (continued)

Components	<i>P. montevidense</i>	<i>P. parlatorei</i>	Retention Index		Identification methods
			DB-5	Supelcowax 10	
Spathulenol	2.9	6.5	1573	2110	MS
Cubanol	1.5	-	1632	2097	MS
β -Eudesmol	-	3.5	1649	2240	MS
α -Eudesmol	-	16.5	1652	2234	MS
α -Cadinol	-	1.0	1653	2141	MS
Identified components	98.0	97.7			

Retention index on DB-5 and Supelcowax 10 columns. Unidentified components less than 0.5% are not reported.

Co = peak identification are based on standard comparison with relative retention time.

MS = peak identification are based on MS comparison with file spectra.

Table 1. (continued) in the following on-line document: <http://www.jeobp.com/jeobp/0802/0802050183.pdf>