



Study of the chemical composition of the essential oils of five species of *Lepechinia* from Colombia

Diego C. Durán¹, Camilo Tavera¹, Jose Luís Fernández², Jairo R. Martínez¹, Elena Stashenko^{1*}

¹ Research Center for Biomolecules- CIBIMOL, Chromatography and Mass Spectrometry Research Center CROM-MASS, Research Center of Excellence CENIVAM, Universidad de Santander, Carrera 27, Calle 9, Edificio 45, Bucaramanga, Colombia

² Institute of Natural Sciences, Universidad Nacional de Colombia. Bogotá, Colombia

*elena@tucan.uis.edu.co

Keywords: *Lepechinia*, essential oil, GC-MS.

The genus *Lepechinia* (Lamiaceae) grows from Northern Mexico to Chile. Ten species of this genus are used in traditional Colombian medicine to treat urinary, gastrointestinal infections and diabetes. Mainly, sesquiterpenoid type compounds have been found in *Lepechinia* essential oils (EO). *L. schiedeana* collected in Colombia was rich in ledol (37 %) and Δ -3-carene (22 %) (1). Five species of the *Lepechinia* genus were collected in different regions of Colombia, and identified in the Colombian National Herbarium: *L. vulcanicola* (Bogotá, COL 521090), *L. betonicifolia* (Bogotá, COL 521102), *L. bullata* (Guaca, COL 517763), *L. conferta* (Toca, COL 521068), *L. salviifolia* (Sogamoso, COL 521027, Samacá, COL 521070 and Bogotá, COL 521061). The essential oils were obtained using microwave-assisted hydrodistillation (MWHHD) and characterized by gas chromatography-mass spectrometry (GC, Agilent Technologies 6890; MSD 5973 and 5975). Fused-silica capillary columns DB-5MS (J&W Scientific, Folsom, CA, USA) of 60 m X 0.25 mm i.d., coated with 5% phenyl dimethylsiloxane (0.25 μ m film thickness) and DB-WAX (J&W Scientific, Folsom, CA, USA) of 60 m X 0.25 mm i.d., coated with polyethyleneglycol (0.25 μ m film thickness) were used. Helium was used as carrier gas (1 mL min⁻¹, at constant flow). Compounds identification was based on chromatographic (retention times and linear retention indices, use of standards) and spectrometric (mass spectra interpretation, comparison with databases NIST, Adams, Wiley, and standards) criteria (2). The EO chemical composition was compared by means of principal component analysis (PCA, statistics, version 6.0, StatSoft Inc.). The results showed that these *Lepechinia* species have high level of monoterpenes (40-60%), mainly limonene, α and β -pinene and Δ -3-carene. Sesquiterpenoids represented 25-35 % of the composition, mainly with *trans*- β -caryophyllene, α -humulene, germacrene D, bicyclogermacrene, γ -curcumene and palustrol. The PCA applied to the composition of the EOs showed three principal groups: **1.** ledol + palustrol (*L. vulcanicola* and *L. betonicifolia*); **2.** camphor + borneol (*L. salviifolia*); **3.** *p*-cymene + β -pinene (*L. conferta* and *L. bullata*). The extraction yields for the five species ranged between 0.7 and 1.1 % w/w. For the first time the chemical composition of the essential oils of *L. vulcanicola*, *L. betonicifolia* and *L. conferta* was reported.

1. Fernández Alonso, J. L. & Rivera-Díaz O. Las labiadas. In García N. & Galeano G. (eds). Libro Rojo de Plantas de Colombia. Volume 3. Instituto de Ciencias Naturales. Bogotá, 2006, 388-402.
2. Adams, R.P. Identification of essential oil components by gas chromatography/ mass spectrometry. 4th edition, Allured Publishing Corporation, Carol Stream, Illinois, 2007.

Acknowledgements: Colciencias - Patrimonio Autónomo Fondo Nacional de Financiamiento para la Ciencia, la Tecnología y la Innovación, Francisco José de Caldas, Contract RC-0572-2012.