Comparison of volatile secondary metabolites of the *Gardenia augusta* flowers at different times of day through solid-phase microextraction and gas chromatography coupled to mass spectrometry

Karol Carrillo Jaimes, Lady J. Sierra, Jesica Mejía, Jairo R. Martínez, Elena E. Stashenko*

Research Center for Biomolecules-CIBIMOL, Chromatography and Mass Spectrometry Research Center CROM-MASS, Research Center of Excellence CENIVAM, Universidad Industrial de Santander, Carrera 27, Calle 9, Edificio 45, Bucaramanga, Colombia
*elena@tucan.uis.edu.co

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The *Gardenia* genus belongs to the Rubiaceae family and consists of 23 species. One species is *Gardenia augusta*, native of China, also known as "*Jazmín del Cabo*" and its use is ornamental. It is identified by its white flower with a pleasant aroma (1). The aim of this study was to compare the volatile profile of *G. augusta* flower at different times of day (6:00, 12:00 and 18:00h), sampled with headspace solid-phase microextraction (HS-SPME). Preliminary experiments using different fiber polarities (PDMS, Carboxen-PDMS and Carboxen-PDMS-DBV) showed that Carboxen-PDMS fiber and 30 min exposure afforded the largest chromatographic areas. Identification of secondary metabolites was based on mass spectra (electron ionization EI, 70 eV) obtained under splitless injection with a gas chromatograph (GC, Agilent Technologies 7980) equipped with a mass selective detector (MSD*A.T.* 5975C), and a DB-WAX (J&W Scientific, Folsom, CA., USA) 60 m X 0.25 mm i.d. capillary column coated with polyethyleneglycol (0.25 µm film thickness). The GC oven temperature was programmed from 50 °C (5 min) to 150 °C (2 min) at 5 °C min^{-1}, and then to 230 °C (35 min) at 5 °C min^{-1}. Mass spectra and reconstructed chromatograms were obtained by automatic scanning in the mass range *m/z* 40–350 at 3.5 scan s^{-1}. The major compounds present in *G. augusta* flower at 6:00h were: *trans*-β-caryophyllene (22 %), hex-3-en-ol (20 %), hexan-1-ol (10 %), α-humulene (4 %), α-cadinol (1 %); at 12:00h the main components found were *trans*-β-caryophyllene (36 %), hex-3-en-ol (9 %), α-humulene (8 %), hexan-1-ol (4 %), *trans*-β-elemene (2 %), α-cadinol (1 %), α-muurolene (1 %), and *p*-cadinene (1 %). At 18:00 h the following metabolites were identified: *trans*-β-caryophylene (14 %), hexan-1-ol (11 %), linalool (11 %), α-humulene (2 %), andα-cadinol (1 %). The main component at all times was *trans*-β-caryophyllene. This compound has antidepressant and anti-inflammatory properties, and is used as an additive in the food industry (2).

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