Oxygen radical absorbance capacity and GC-MS identification of the secondary metabolites of essential oils obtained by steam distillation of *Turnera diffusa*

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Turnera diffusa (damiana) belongs to the Turneraceae family. This aromatic plant grows in Mexico, Central America, India and in some parts of South America (1). Damiana has high relevance, because it is used for making tea, alcohol flavoring, diuretic, afrodisiac, astringent among other uses (2). In this research, a chemical comparison of *T. diffussa* essential oil collected in different periods was made. The *T. diffusa* plants were collected in Zapatoca town (Santander, Colombia) on two different occasions corresponding to 2014 and 2015. Damiana essential oils were obtained by steam distillation from diced vegetal material (stems and leaves) with yields of 0.29 and 0.07 %, respectively. The secondary metabolites separation and identification was done in an Agilent Technologies 6890 GC (AT, Palo Alto, CA, USA) equipped with a 5973 mass selective detector (EI, 70 eV), split/splitless injector (split 30:1) and MSD Chemstation G1701-DA software including spectral databases (ADAMS, NIST and WILEY). DB-5 and DB-WAX (60m X 0.25mm, D.I. X 0.25 µm) columns were used. The ORAC assay (3,4) was implemented in a Turner Biosystems Modulus II microplate reader. Different dilutions were used for each sample, which permitted to find the time at which 5 % of the initial fluorescence was obtained. The relative amounts of the major secondary metabolites in the essential oils of the two collection periods were *p*-cymene (3.4 and 1.2 %), *trans*-β-caryophyllene (3.8 and 2.2 %), 4,5-di-epi-aristolochene (16.1 and 10.0 %) and dehydrofukinon (11.8 and 22.0 %). ORAC values for the essential oils of *T diffusa* (2014 and 2015 collections) were 584 ± 2 and 630 ± 25 µmol Trolox®/g substance, respectively. These were higher than commonly used antioxidants: α-tocopherol (550 ± 13 µmol Trolox®/g substance) and BHT (457 ± 9 µmol Trolox®/g substance). Soriano-Melgar et al. (4) and Wong-Paz et al. (5) found *T. diffusa* showed similar strong antioxidant activities with different methods as scavenging of DPPH, lipid oxidation inhibition and the activity of the antioxidant enzymes SOD. The results obtained suggest that damiana is potential source to obtain bioactive compounds with antioxidant properties.

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