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ESSENTIAL OILS CONSTITUENTS AND ANTIMICROBIAL ACTIVITY FROM HIGH ALTITUDE BRAZILIAN SPECIES: *Baccharis parvidentata, Hyptis monticola* AND *Lippia origanoides*

Perera, W. H. [1a*], Bizzo, H.[2], Gama P.[2], Alviano C. S.[3], Salimena, F. R.[4], Alviano, D. S[3] and Leitão, S.[1b*]

[1a] PhD, [1b] Prof. of Universidade Federal do Rio de Janeiro, Faculdade de Farmácia, CCS, Bl. A, Ilha do Fundão, 21.941-590 Rio de Janeiro, Brazil.Wilmer.Perera@gmail.com; sgleitao@superig.com.br

[2] PhD of Embrapa Food Technology, Avenida das Américas 29501, Guaratiba, 23020-470, Rio de Janeiro, Brazil.

[3] Prof. of Instituto de Microbiologia Paulo de Góes, Centro de Ciências da Saúde (CCS), Bloco I, Universidade Federal do Rio de Janeiro, Ilha do Fundão, 21941-590, Brazil.

[4] Prof. of Universidade Federal de Juiz de Fora, Inst. Ciências Biológicas, Depto. Botânica, R. José Lourenço Kelmer s.n., Juiz de Fora, 36033-900, Minas Gerais, Brazil.

Introduction

Essential oils have been used in aromatherapy, pharmacy, perfumery, cosmetics, as well as food preservatives among other industrial uses (Lubbe & Verpoorte, 2011). Brazil is reputed by its floristic diversity, hence its flora should be considered as an important reservoir of active molecules with potential industrial applications. (Valli et al., 2012). Herein, three wild species have been investigated: Baccharis parvidentata Malag (Asteraceae). Hyptis monticola Mart. ex Benth (Lamiaceae) and Lippia origanoides Kunth. (Verbenaceae).

Method

B. parvidentata (W: 43° 01.681'; S: 22° 27.594'; altitude: 2100m) was collected around Pedra dos Sinos, Teresópolis. H. monticola (W: 44° 41.166'; S: 22° 02.196'; 1229m) and L. origanoides (W: 43° 17.443'; S: 22° 25.341'; 1.239m) were harvested on the climb of Morro do Cuca, Vale das Videiras, Petrópolis. All species were collected in Rio de Janeiro, Brazil in October 2013.

200 g of fresh aerial parts of B. parvidentata and L. origanoides, and fresh leaves of H. monticola were submitted to hydrodistillation in a Clevenger-type apparatus for 3h (n=3). The oils were analyzed in an Agilent GC-FID and GC-MS gas chromatograph equipped with a HP5-MS (5%-phenyl-methylsilicone, 30 m x 0.25 mm x 0.25 μm) fused silica capillary column (n=3). The GC settings were as follows: the initial oven temperature was 60°C, the raised to 240°C at 3°C/min and hold for 10 min. Hydrogen was used as carrier gas at a flow rate of 1 mL/min. The injector was maintained at 250°C and detector (FID) was kept at 280°C. Quantification was performed by the normalization method from the electronic integration of the FID peak areas. Constituents were identified by comparison of both mass spectra and GC retention indices with those from NIST and Wiley libraries, as well as literature data (Adams, 2009). Antibacterial and antifungal activities for B. parvidentata and L. origanoides were assayed by broth micro dilution method according to procedures of the Clinical Laboratory Standard Institute against Escherichia coli ATTCC 11229, Staphylococcus aureus (MRSA BMB 9393), Candida albicans Serotype B ATCC 10231, Cryptococcus neoformans Serotype A, Aspergillus niger ATCC 16404, Fonsecaea pedrosoi 5VPL, Trycophyton rubrum T544. Results were obtained in triplicate and expressed as minimum inhibitory concentration (MIC).

Results / Discussion / Conclusion

Essential oil yields were 0.50 % for B. parvidentata, 0.05% for H. monticola and 0.56 % for L. origanoides. The most noteworthy compounds from B. parvidentata were sabinene (15.2%), himachalol (10.3%), β-pinene (9.2%) and δ-3-carene (5.7%). H. monticola was characterized predominantly by trans-caryophyllene (11.3%), trans-methyl-cinnamate (7.8%), germacrene-D (6.9%), limonene (6.6%), α-muurolene (6.4%) and β-pinene (5.6%) whereas the most prevalent components for L. origanoides were trans-methyl cinnamate (40.0%), hedycaryol (8.0%), α-eudesmol (8.0%) and β-

eudesmol (7.0%). To the best of our knowledge, this is the first report about chemical composition of B. parvidentata and H. montila. C. neoformans yeast was the most sensitive strain against essential oil from L. origanoides with MIC of 78µg/mL whereas T. rubrum were the most sensitive filamentous fungus against essential oil from B. parvidentata with MIC of 156µg/mL.

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