Secretory structure, chemical composition, antioxidant and antimicrobial activities of essential oil from *Lavandula dentata* L. (Lamiaceae)

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Lavandula is one of the most important genera of Lamiaceae (1). This genus is originally found in Mediterranean region, Arabian Peninsula, India and Canary Islands and shows very popular plants of aromatic, ornamental, and medicinal properties (2). The aim of this study was to analyze the secretory structures of *Lavandula dentata* as well as to extract the essential oil, to determine its chemical composition and to evaluate its antioxidant and antimicrobial activities in Brazil. Aerial parts of *L. dentata* were collected in Horto Medicinal of Universidade Estadual de Ponta Grossa – Campus Uvaranas (25°5'23"S 50°6'23"W), Ponta Grossa – Brazil. Usual techniques of electron and light microscopy were used. The essential oil was extracted through hydrodistillation using a Clevenger apparatus during 6 h. Volatile composition of *L*. *dentata* essential oil was performed by GC/MS. Antioxidant potential was investigated by phosphomolybdenum, 2,2-diphenylpicrylhydrazyl (DPPH), and 2,2'-azino-bis-(3-ethylbenzthiazoline-6-sulfonic acid) (ABTS) methods. Antimicrobial effect was determined by minimum inhibitory concentration using microdilution broth method. Microplates containing bacterial inoculum and serial dilutions of essential oil were incubated at 35 °C for 24 h. Minimum bactericidal concentration was then evaluated in Petri dish containing BHI agar for 24 h at 35 °C. Secretory structures were represented by glandular trichomes which comprise capitate and peltate ones. The major volatile component of *L. dentate* essential oil was 1,8-cineole (63.2 %). Regarding antioxidant activity, *L. dentata* essential oil at 200 µg mL^{-1} had a relative antioxidant activity of 28.0 % compared to ascorbic acid (100 %) by phosphomolybdenum assay. This volatile oil showed an antioxidant activity of 11.9 % at 20 mg mL^{-1} for DPPH scavenging assay comparing to rutin and gallic acid. By ABTS method, *L. dentata* essential oil achieved 22.0 % ofactivity after 30 min compared to the same standards. A minimum inhibitory concentration (MIC) of 54.7 µg mL^{-1} was observed for *Escherichia coli*, *Candida albicans*, *Staphylococcus aureus*, and *Streptococcus pyogenes*. *L. dentata* essential oil demonstrated a MIC value of 437.5 µg mL^{-1} for *Pseudomonas aeruginosa*. Minimum bactericidal concentration (MBC) of 54.7 µg mL^{-1} was achieved for *E. coli, C. albicans*, and *S. pyogenes*. For *S*. *aureus*, *L. dentata* essential oil presented a MBC value of 218.8 µg mL^{-1}, while no MBC value was detected for *P*. *aeruginosa*.

1. The Plant list. http://www.theplantlist.org. Accessed in 29.06.2015.
2. Gonçalves, S.; Romano, A. Biotechnology Advances, 2013, **31**, 166-174.

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