



Secretary structure, chemical composition, antioxidant and antimicrobial activities of essential oil from *Eucalyptus alba* Reinwex. Blume

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Eucalyptus is represented by over 700 species worldwide (1). Due to the main use in wood processing and wood-based materials, paper and cellulose production and vegetable coal, some particular taxa of *Eucalyptus* as *E. alba* play an important role in Brazilian economy (2). Therefore, this study aimed to analyze the secretary structures of *E. alba* as well as to extract the essential oil, to determine its chemical composition and to evaluate its antioxidant and antimicrobial activities. Leaves of *E. alba* were collected in Ponta Grossa – Brazil. Usual techniques of electron and light microscopy were used. The essential oil was extracted through hydrodistillation using Clevenger apparatus during 6 h. Volatile composition of *E. alba* essential oil was performed by GC/MS. Antioxidant potential was investigated by 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. As secretary structure, leaves showed oil cavities in mesophyll. The major volatile component of *E. alba* essential oil was 1,8-cineole (55.2 %). This volatile oil showed antioxidant activity of 25.5 % at 20 mg mL⁻¹ for DPPH scavenging assay comparing to rutin and gallic acid. By ABTS method, *E. alba* essential oil also achieved 25.5 % of activity after 30 min compared to the same standards. A minimum inhibitory concentration (MIC) of 416.5 µg mL⁻¹ was observed for *Escherichia coli* and *Pseudomonas aeruginosa*. *E. alba* essential oil demonstrated a MIC value of 208.3 µg mL⁻¹ for *Staphylococcus aureus*. A MIC value of 104.1 µg mL⁻¹ was verified for *Candida albicans* and *Streptococcus pyogenes*. The same values were observed as minimum bactericidal concentration (MBC) for *E.coli*, *C. albicans*, *S. aureus*, and *S. pyogenes*, while no MBC value was detected for *P. aeruginosa*.

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