Chemical composition, cytotoxicity and antimicrobial activity of extract from Brazilian green propolis

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Abstract:

Green propolis is produced by bees from resinous substances collected in bushes of *Baccharis dracunculifolia,* popularly known as “vassourinha” or “alecrim do campo”, found in the southern region of Minas Gerais state and in some locations in the state of São Paulo, Brazil. It is used in folk medicine, especially due to anti-inflammatory, antimicrobial, antioxidant and healing properties. These biological activities are associated mainly with the presence of flavonoids, terpenes, esters, and the acids caffeic, ferulic and coumaric. The chemical composition of propolis extract was evaluated in this study by the determination of total soluble solids, phenols, flavonoids and chemical profile on HPLC. The cytotoxic activity was performed in laryngeal cells (HEP-2) using three different concentrations and exposition of cells for 2 and 24h. Antimicrobial activity was evaluated against bacterial indicators of clinical importance in infections of the respiratory system, namely *Staphylococcus aureus* ATCC 25923, *Streptococcus pneumoniae* ATCC 49619 and *Klebsiella pneumoniae* ATCC 10031. The results of chemical characterization showed high levels of antimicrobial compounds, with the presence of caffeic acid, p-coumaric acid and Artepelin C. Cytotoxicity tests showed the exposure for two hours of HEP-2 cells did not cause important cell damage or death, while upon increased exposure period, only slight morphological changes were observed. The gram positive *S. pneumoniae* and *S. aureus* were most susceptible to the propolis extract, with a minimum bactericidal concentration (MBC) of less than 2 mg / ml and for *K. pneumonia*, the MBC was ca. 7mg / ml. It was also observed that in the presence sub MBC doses of propolis extract there was a longer latent phase, compared with growth under optimum conditions. The results showed that extract of green propolis is rich in active substances and presented antibacterial activity mainly against the gram positive bacteria studied.

Keywords: Extract of Green propolis, antimicrobial activity

Acknowledgement: Apis flora Indl. e Coml. Ltda