ANTIBACTERIAL POTENTIAL OF THE METHANOLIC EXTRACT OF PROPOLIS OF THE NATIVE BEE *Melipona quadrifasciata*

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Studies in the search for biologically active compounds of natural products of the Brazilian biodiversity are on the rise with the purpose of increasing the availability of drugs against microorganisms. The antibacterial activity is the most studied one, and necessary for the urgency to combat bacterial resistance. Biofilms are also part of the intrinsic resistance of bacteria, and it is estimated that they are involved in 65% of all bacterial infections. The propolis of the species *Melipona quadrifasciata* has been demonstrated as a potential natural antimicrobial agent against different species of mycoplasma.

We have obtained a methanolic extract by maceration of the propolis sample that was fractionated with solvents of different polarities by liquid-liquid partition. The analysis of the fractions was directed biomonitoring of its antimicrobial activity against species of bacteria without cell walls (*M. genitalium*, *M. pneumoniae*, *Mycoplasma capricolum*, and *M. mycoïdes* subsp. *capri*) for further purification by column chromatography. The fractions and sub-fractions were analysed by Gas chromatography–mass spectrometry (GC-MS) and its compounds were identified using the NIST library. Minimum inhibitory concentrations (MIC) of the samples were determined by broth microdilution technique. Antiadhesive assays were performed in microtitration plates with *M. pneumoniae*.

The hexane (MIC 62.5 μg mL⁻¹) and dichloromethane (125 μg mL⁻¹) fractions presented the most promising results, against *Mycoplasma pneumoniae*. They were fractionated in silica gel and alumina chromatographic columns resulting in the subfractions FHb 12 and 15, FDb 4 and 7. However, the subfractions did not presented better results (MIC> 250 μg mL⁻¹) than their original fractions. On the other hand, the subfraction FDb 4 was highlighted in the antiadhesive test against *M. pneumoniae* with an inhibitory activity of 21.6%. We have identified 39 compounds in the hexane fraction and 6 in the dichloromethane one, and 15, 8, 24 and 13 compounds in the FHb 12, FHb 15, FDb 4 and FDb 7 subfractions, respectively.

It seems that a synergistic effect of the *M. quadrifasciata* propolis compounds is responsible for the antibacterial activity, but purified components improve its antiadhesive properties.

CONCLUSIONS