



## ANTIBACTERIAL, ANTIBIOFILM, KINETICS, SYNERGISTIC AND CYTOTOXIC PROPERTIES OF *COPAIFERA RETICULATA* OILRESIN: *IN VITRO* STUDIES

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**Abstract:** Microbial populations colonizing the teeth are a major source of pathogens responsible for oral and dental infections, including periodontal diseases, endodontitis, and carie [1]. Plant-derived compounds represent a viable alternative in the search for effective agents in preventing these diseases as currently available for the treatment of oral infections have various side effects [2,3]. This study evaluated the antibacterial and cytotoxic potential of *Copaifera reticulata* oleoresin and it was used as analysis parameters the minimum inhibitory concentration (MIC), minimum bactericidal concentration (MBC), antibiofilm activity, bactericidal kinetics (Time-Kill Assay) and fractional inhibitory concentration index (ICIF). We also used the clonogenic efficiency assay in V79 cells for evaluation of cytotoxicity. Aerobic, microaerophilic and anaerobic bacteria representative of oral infections have been tested. The results of MIC and MBC were satisfactory with more than 70% of the bacteria tested inhibited at concentrations less than or equal to 100 µg/mL. Others experiments were carried out with seven representative bacteria with best results at MIC. The results of determination of the minimum inhibitory concentration of biofilm (CIMB<sub>50</sub>) confirmed the increased resistance of biofilm mode with respect to planktonic mode cells with three bacteria, eight times more resistant. The best results were obtained in this test with *S. mutans* and *F. nucleatum*. The biofilm formed by them was inhibited with the same concentration with which the planktonic cells were inhibited. In regard to bactericidal kinetics we can emphasize that the *C. reticulata* oleoresin showed bactericidal action in a time shorter or the same as chlorhexidine, used as control. *C. reticulata* oleoresin combined with chlorhexidine presented ICIF demonstrating antagonistic interaction for the bacteria *L. casei* (clinical isolate), indifferent to *P. gingivalis* (ATCC 33277), *F. nucleatum* (ATCC 25586), *P. nigrescens* (ATCC 33563) and *S. salivarius* (ATCC 25975) and additive for bacteria *S. mutans* (ATCC 25175) and *S. mitis* (ATCC 49456). The clonogenic efficiency assay revealed that oleoresin concentrations above 39.5 µg/mL are toxic to normal cells. With these results, we can conclude that the *C. reticulata* oleoresin presents a promising antibacterial activity, and a cytotoxic effect in V79 cells with concentration values higher than 39.5 µg/mL.

### References:

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