ANTIMICROBIAL ACTIVITY OF CHITOSAN ASSOCIATED WITH Mentha piperita ESSENTIAL OIL AGAINST CARIOGENIC BACTERIA

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Introduction: Dental caries is an infectious disease caused by bacteria. Chemical control is the primary mechanism for reducing dental plaque formation, but because of their disadvantages, there have been attempts to replace these products by natural compounds such as chitosan and essential oils. Objective: The aim of this study was to evaluate the antimicrobial activity of chitosan (CHI) and Mentha piperita essential oil (MpEO), separate and associates, against Streptococcus salivarius, Lactobacillus acidophilus, Streptococcus mutans and Streptococcus sanguis. Material and Methods: Inoculum of the bacteria adjusted to 5 x 10^7 colony Forming Unity/mL, were used as test microorganism. Chitosan with low molecular weight from Sigma®, was solubilized in 1% acetic acid (10mg/mL). The Mentha piperita essential oil was soluble (100µL/mL) in distilled water containing tween 80 as a stabilizing agent. The pHs of solutions were adjusted for 5.8 using NaOH. The antimicrobial assays were carried out by macrodilution method in BHI broth, and subsequent incubation in BHI agar without substance test, for determine the Minimum Inhibitory Concentration (MIC), and the Minimum Bactericidal Concentration (MBC), respectively. Bacteria were incubated at 37°C/24h. The concentration of substance test varied: CHI (6.0-0.5mg/mL), MpEO (60-5µl/mL). Results and discussion: The CHI solution demonstrated MIC and MBC: 3mg/ml and 4mg/ml to L. acidophilus; 1mg/ml and 2mg/ml to S. mutans, S. sanguis and S. salivarus, respectively. The MpEO shows MIC and MBC: 40µl /ml and 50µl /ml to L. acidophilus; 50µl/ml and 60µl/ml to S. mutans, S. sanguis and S. salivarus, respectively. Association of CHI and MpEO exhibited a synergetic effect by enhancing the antimicrobial activities of the chitosan, expressed by the decrease in MIC and MBC concentrations. Conclusion: This study demonstrates the antimicrobial activity of CHI and MpEO and the synergistic effect. This potential should be further evaluated for application in pharmaceutic industry.

Keywords: Antimicrobial agents, biopolymers, natural products.

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