



ANTIMICROBIAL EVALUATION OF THE ASSOCIATION OF CHITOSAN WITH THE EXTRACT OF *Piper solmsianum* (Piperaceae) LEAVES

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INTRODUCTION

Nature provides us with several compounds with pronounced antimicrobial activity. The plant species *Piper solmsianum*, known in Brazil as pariparoba, has antibacterial and antifungal properties. From the exoskeleton of marine crustaceans it is possible to obtain chitin, which can be transformed into chitosan (QTS). QTS can present itself in different forms (solution, gel, film) with antimicrobial actions, among others. The aim of this study was to evaluate the antimicrobial action of the association between QTS and *P. solmsianum* extract.

MATERIALS AND METHODS

The crude methanolic extract (CME) was obtained from the maceration of *Piper solmsianum* leaves at room temperature and subsequent filtering, solvent removal and extract concentration under reduced pressure at 50 °C. A 2.4% (m/v) chitosan solution was prepared by dissolving the material in 4.0% (m/v) CH₃COOH. The Minimum Inhibitory Concentration (MIC) determinations were performed by the broth microdilution method, and the Minimum Bactericidal/Fungicidal Concentration (MBC/MFC) determinations were performed through replication in Mueller-Hinton agar and Sabouraud agar of the cultures obtained from the previous MIC. The association of QTS and the EMB of *Piper solmsianum* was tested by the Checkerboard method.

RESULTS

The MIC of CME was 3,90 µg/mL and the MBC was 7,81 for *Staphylococcus aureus*, MIC of 31,25 µg/mL e MFC was 62,5 µg/mL for *Candida albicans*. No activity was shown against *Pseudomonas aeruginosa* and *Escherichia coli*. The QTS presented MIC of 2,92 µg/mL and MBC of 5,85 µg/mL for *S. aureus*; MIC of 187,5 µg/mL and MBC of 375 µg/mL for *E. coli*; MIC of 46,87 µg/mL and MBC of 93,75 µg/mL for *P. aeruginosa*; MIC of 1500 µg/mL for *C. albicans*. The association of CME and QTS revealed additive activity for *S. aureus*, while for *C. albicans*, *P. aeruginosa* and *E. coli*, it was indifferent.

CONCLUSIONS

The QTS showed activity against all the microorganisms tested. The CME of *P. solmsianum* showed activity against the fungus and gram-positive bacteria. In association, QTS and CME of *P. solmsianum* showed additive activity against *S. aureus*. As a perspective, the association between QTS and *Piper* extract can expand its biomedical applications, being used as a bandage or protective film with antimicrobial action for hospital food and instruments.

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