

TITLE: CHARACTERIZATION AND EVALUATION OF ANTIMICROBIAL ACTIVITY OF THE GELATIN MUCOADHESIVE MEMBRANE CONTAINING THYMOL IN β -CYCLODEXTRIN.

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ABSTRACT

Oral infections are associated with changes in the oral microbiota and also with the appearance of systemic diseases. Among the natural products commercially used in dental formulations is thymol (TM). However, this compound presents some limitations related to its physical-chemical and pharmacological stability. Many strategies have been explored and developed, including the use of mucoadhesive systems containing inclusion complexes (IC). Henceforth, the aim of this study was to characterize and evaluation of antimicrobial activity of the gelatin mucoadhesive membrane containing tymol complexed in β -cyclodextrin (β -CD). The membranes were obtained by means of the solvent evaporation technique and the IC by means of lyophilization in molar ratios of 1:1. The characterization of the membranes was performed through the techniques of scanning electron microscopy (MEV), swelling capacity and mucoadhesion. The quantification of TM release from IC and membrane was performed with high-performance liquid chromatography (HPLC). The assessment of the microbiological activity was performed by disk diffusion method with *Escherichia coli* and *Staphylococcus aureus*. The results showed that the presence of IC causes considerable modifications in the morphological aspects of the membranes, increase mucoadhesive and macroscopically presented smooth surface and swelling capacity in phosphate buffer (>60%). In addition, the TM content in the membranes was 10.42 ± 0.05 mg/mL, obtaining entrapment efficiency (EE) of 77.87%. The membranes demonstrated an antibacterial effect of the membranes on species of *S. aureus* and *Escherichia coli* ($5,0 \pm 0.082$ and $4,0 \pm 0,141$, respectively). These results confirm that the membranes containing IC can be used in the TM delivery, but also open the possibility to perform future searches *in vitro* release studies and animal models.

Keywords: Thymol; Oral infections; mucoadhesive; inclusion complex.

Agencies: FAPITEC, CNPq