

TITLE: ANTIMICROBIAL ACTIVITY EVALUATION OF SILVER NANOPARTICLES IN *Rhodococcus equi*

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ABSTRACT:

The *Rhodococcus equi* species represents a great impact for the echinoculture, as it is responsible for causing pneumonia in foals, besides being a pathogen for immunosuppressed humans. With the emergence of resistant strains of *R. equi* to traditional antimicrobials, new antimicrobial alternatives are essential for the control of this infection. In this context, nanoparticles can be a promising alternative, as their reduced size provides a larger surface area, increasing its effectiveness, especially the silver nanoparticles, which demonstrate the efficiency against various diseases. Thus, the objective of the present study was to verify the antimicrobial activity of silver nanoparticles in *R. equi*. The silver nanoparticles were obtained by the chemical reduction method, using the protocol of Lee and Meisel (1982), then, they were characterized by visible ultraviolet spectrophotometry. To verify the antimicrobial activity of the nanoparticles, the Minimum Bactericidal Concentration (CBM) technique and the interference of the nanoparticles on the formation and consolidated biofilm were performed, for that, 30 isolates of *R. equi* were used in the total. In the CBM test, 11 (36.67%) isolates were sensitive only to the first concentration (1: 1) of silver nanoparticles. The other isolates were not sensitive to any concentration. To determine the interference of the nanoparticles in the biofilm production, the production capacity of this structure was verified by the isolates. Of the 30 isolates, 27 were classified as biofilm producers, and these were used for biofilm inhibition assays in formation and consolidated. Of the 27 isolates, 25 became non-biofilm producers after application of silver nanoparticles. In the consolidated biofilm, no effect of the nanoparticles was observed on any isolates. Based on the results obtained, the nanoparticles can be used as an alternative for the treatment of *R. equi* infections, especially as a biofilm inhibitor, which may contribute to the success of antimicrobial therapy currently quite limited.

Keywords: Echinoculture. *Rhodococcus equi*. Biofilm. Resistance. Nanotechnology.

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