TITLE: ANTIMICROBIAL ACTIVITY OF SILVER NANOPARTICLES SYNTHESIZED FROM *SCHINUS TEREBINTHIFOLIUS* RADDI

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ABSTRACT:

The absence of new antimicrobials to treatment of infectious diseases reduces terapy alternatives; consequently, represents a public health problem and, therefore, the search for antimicrobial solutions becomes required. In this context, advances in the area of nanobiotechnology have enabled the advent of a new pharmaceutical perspective, the silver nanoparticles (AgNPs). This study aimed to evaluate the antimicrobial activity of silver nanoparticles synthesized from the aqueous extract of *Schinus terebinthifolius* Raddi leaves compared to the extract aqueous extract of *Schinus terebinthifolius* Raddi leaves. The analysis of the phytochemical composition of ethanol extract *Schinus terebinthifolius* Raddi allowed the determination of the secondary metabolites present in the plant. The complete 2^3 factorial design was realized to analyze the significant variables in the green synthesis: pH, leaf mass and time. Box-Behnken design was used to define the optimal conditions for the green synthesis of AgNPs. The samples were characterized using X-ray diffraction (XRD), scanning electron microscopy (SEM) and fourier transform infrared spectroscopy (FTIR). Antimicrobial activity was evaluated using the broth microdilution method and through the minimum microbicidal concentration. The three factors studied in the design were significant for the synthesis of nanoparticles. The optimal conditions from the Box-Behnken design were: pH 9.5; reaction time of 180 minutes and 10 grams of *Schinus terebinthifolius* Raddi leaves. The characterization demonstrated the formation spherical nanoparticles silver and silver oxide coated with compounds present in the extract. The AgNPs showed greater antimicrobial efficacy compared to extract, both for bacteria and fungi: bacteriostatic activity against all tested bacteria and bactericidal against *Pseudomonas aeruginosa*; as well as, fungistatic action against *Candida albicans* and *Candida glabrata*.

Keywords: antimicrobial activity; green synthesis; *Schinus terebinthifolius* Raddi; silver nanoparticles

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