

Antimicrobial Activity of Functionalized Alpaca Fabrics with Silver Nanoparticles

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Abstract : Vicuñapacos "alpaca" fabrics are considered special for their finesse, and the garments in the textile market are very luxurious. It has many special characteristics such as antiallergic, soft, hygroscopic, among others. In this sense, the research aimed to evaluate the antimicrobial activity of alpaca fabrics functionalized with silver nanoparticles on the bacteria *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 25923. For the functionalization of the fabrics, AgNO₃ and different concentrations of trisodium citrate (TSC) 2, 6, and 10 mg. Tissue characterization was performed using Raman spectroscopy, Fourier transform infrared spectroscopy (FTIR), and scanning electron microscopy (SEM). The determination of the antimicrobial activity of the alpaca tissues was made by the Kirby-Bauer method with alpaca tissue discs functionalized with silver nanoparticles, an experimental design was made in completely randomized blocks with three treatments and a negative control with three repetitions. The results showed that inhibition halos were formed for both bacteria, therefore, the functionalized tissues have a high antimicrobial activity, whose mechanism of action is attributed to the free radicals (ROS) generated by the nanoparticles that cause oxidative damage to the bacteria. proteins and lipids of the bacterial cell wall.

Keywords : antimicrobial, animal fibers, fabrics, functionalization, trisodium citrate

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