Silver nanoparticles (AgNPs) deposited or impregnated materials (metal, polymer, metal oxide, carbon, cellulose) have been widely investigated for their unique physico-chemical properties such as optical, electrical, catalytic and anti-microbial, due to their unusual interfacial effects. An intensive research effort has been made to introduce AgNPs in various materials for the effective antimicrobial properties. Inclusion of AgNPs into natural fibers (cellulose as well as cotton) has been performed using various techniques including sonochemical, microwave, chemical reduction as well as bioreduction (using fungus, plant leaf extract). Among them, plant leaf extract mediated biological process is found to be simple and cost effective.

Recently, *Camellia sinensis* (green tea) extract has been used as a reducing and stabilizing agent for the biosynthesis of silver nanoparticles in an aqueous solution in ambient conditions. Phenolic acid type biomolecules (e.g., caffeine and theophylline) present in the *C. sinensis* extract seemed to be responsible for the formation and stabilization of silver nanoparticles.

In this investigation, a silver nanoparticles-biocomposite using cellulose fiber as support and *Camellia sinensis* as reducing agent was obtained and characterized. Additionally, its antibacterial activity was evaluated. To prepare the biocomposite, cellulose fibers with anionic charge were immersed in a solution of silver ions. Then, cellulose fibers were placed in a *Camellia sinensis* aqueous extract. This biocomposite was characterized by infrared spectroscopy to identify possible structural changes of cellulose. SEM study was performed to determine the degree of impregnation of the fibers with nanoparticles. Size distribution of nanoparticles was determined by TEM technique. XPS proved the presence of silver particles embedded in the cellulose fibers. The antimicrobial activity of the biocomposite was demonstrated on *Escherichia coli* and *Staphylococcus aureus* by using disc diffusion in agar method. Hence, the applications of this biocomposite can be extended to the fabrication of bandages, gauzes and sticking plasters.

**Keywords:** Silver nanoparticles, Camellia sinensis, antimicrobial activity

**References:**


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