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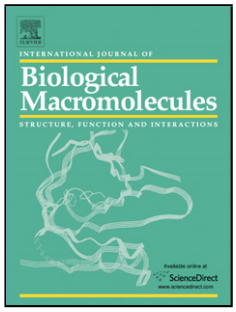

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ACCEPTED MANUSCRIPT

Polyvinyl alcohol / Sodium alginate integrated silver nanoparticles as probable solution for decontamination of microbes contaminated water

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Abstract

It is well known that the pathogenic multidrug resistant microbes are highly distributed and transferred to human through contaminated food and water. Advanced technologies have been developed for controlling these microbes using synthesized nanoparticles. In this study, bio-synthesized silver nanoparticles were prepared, characterized and integrated with two synthetic and natural polymers. The polymers-silver nanoparticles were characterized using SEM, FTIR and mechanical properties of the membrane synthesized from either polymers with/without nanosilver. Both of pathogenic bacteria and yeast were tested for their resistance against 10 different antibiotics. The pathogens showed high resistance against 9 antibiotics and only one was recorded as potent. The cytotoxicity of nanosilver integrated polymers were tested against Hamster kidney cells and Human skin fibroblast cells, and the non-cytotoxic dose was checked for its antimicrobial activity against the selected pathogens. The obtained results in this study confirm that the using of the nanomaterials in safe doses could be a good substitution for biogenic antibiotics and chemicals used in water treatment. Moreover, the beads which were used in this study could be lasts for long period in water treatment station with high antibacterial capacity, in addition, it can be gathered easily at the end of the run.

Keywords: PVA/SA; ; , Silver nanoparticles, Water treatment

1. Introduction

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