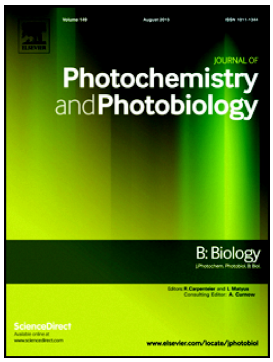

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Enhanced Antimicrobial, anti-oxidant applications of green synthesized AgNPs- an acute chronic toxicity study of Phenolic Azo Dyes & Study of Materials Surface using X-Ray Photoelectron Spectroscopy

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Abstract

The drug resistant bacteria and textile contaminations of water cause different sever health problem throughout the world. To overcome this issue, new environmental benign materials and methods are needed. Plant metabolites directed synthesis of nanoparticles is considered eco-friendly and easy in synthesis. Therefore, it was explicit for the synthesis of AgNPs. The prepared AgNPs were evaluated for antibacterial, antioxidant, photo-catalytic and electrochemical degradation properties as well as toxicity of degradation products on aquatic life. X-Ray Photoelectron Spectroscopy (XPS) has been used for analyzing the surface chemistry of prepared AgNPs. The particle size determines the interaction of nanoparticles with pathogens. Both Gram positive and negative bacteria (*Escherichia coli* and *Staphylococcus areous*) are used to determine the anti-microbial potency of the green synthesized AgNPs. The synthesized silver nanoparticles showed significant anti-bacterial applications against *B. subtilus* and *S. aureus.* The anti-oxidant applications of AgNPs also studied on comparison with vitamin C. The toxicity of the phenolic Azo dyes (PDA) has been studied against Fish, *Daphnia and Green Algae*. The electrode potential was studied in the electrochemical redox reaction of hydroxy phenol in aqueous media. Simple electrolyte was used to determine the current efficiency. For the stability of electrode multi cyclic voltammetry was also studied during redox reaction, which showed stability under the potential 0.4 to 0.2 V.

Kew words: AgNPs, XPS, antimicrobial studies, electrode potential,Toxicity of PDA

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