# Synthesis and characterization of *Azadirachta indica* constructed silver nanoparticles and optimization of adsorption properties onto wastewater

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**Abstract:**

Plant-mediated nanoparticle synthesis remains an eco-friendly method designated to reduce environmental toxicity. Therefore, the present study was aimed to report the effectiveness of silver nanoparticles towards wastewater treatment for the first time, through leaf extract from Azadirachta indica. We employed swift and simple method for synthesizing silver nanoparticles (AgNPs) from aqueous leaf extraction of A. indica which acts as reducing agent as well as capping agent. The compounds responsible for reduction of Ag ions and the functional groups present in plant extract were investigated by UV-spectrum and FTIR analyses. Particle size analysis showed that the synthesized NPs exhibit a mean particle size of 46.081nm under dynamic light scattering and mean range of –1.6 mV Zeta potential. The synthesized AgNPs were tested for adsorption studies onto waste water and the removal effeciency is derived based on the optimized pH, dosage and time.Overall, our results indicated a worthy absorption activity and removal efficiency on waste water. Our results demonstrated the capability of AgNp’s with distinguishing properties that were unexplored previously. Thus, the synthesized AgNp’s presented its potential application in waste water treatment and management towards resolving one of the existing problems in the earth at present.

**Keywords:** Silver Nanoparticles, Azadirachta indica*,*AgNp’s characterization, Adsorption studies, Wastewater treatment.

**Biography of presenting author**

Mr. D. Anand Raj completed biotechnology at the Bharathiar University, India and graduated Master degree in 2016 He then joined the research group of Prof. Dr. S.R. Prabagaran at the Molecular Microbiology laboratory, Bharathiar University of India. He submitted his Doctorate thesis in 2021 and yet to receive his Ph.D degree at the same institution. Following, he obtained the position of an Assistant Professor at the Karpagam University. He has published more than 10research articles in SCI/WOS journals.)

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