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Epoxy Nanocomposites Functionalized using Phytogetic Silver Nanoparticles to Contain Biofilm Formation on PVC Substrates

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The objective of the study was to determine the biofilm degradation potential of silver nano particles (Ag NPs) synthesized using the aqueous bark extract of *Alstonia scholaris* on PVC substrates that are used in water distribution system. The phytogetic AgNPs revealed potent antimicrobial effect. The application of the antimicrobial effective AgNPs, to contain the Biofilm Formation on PVC Substrates was carried out by infusing the AgNPs in an epoxy resin to develop functionalized epoxy nanocomposites which can be used as surface coating on PVC substrates. Precautions were taken using solvent heating process using methyl ethyl ketone and xylene to avoid agglomeration resulting in poor dispersion of nanoparticles.

The surface morphology and mechanical properties of these coatings containing phytogetic AgNPs were characterized using Fourier Transform Infrared Spectroscopy (FT-IR), X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), and Epifluorescence microscopy.

The anti biofilm efficacy of the functionalized epoxy nanocomposite coatings on PVC was investigated by total viable counts (CFU/Cm²) from day one to twenty five day. The results revealed that the phytogetic AgNPs infused epoxy coating, improved the micro structure of the matrix and thus enhanced the anti biofilm performance. Further, the antimicrobial kinetic studies revealed that the effective inhibition of Biofilm Formation on PVC Substrates coated with the epoxy nano composites.

Therefore the functionalized epoxy nano composites surface coatings on PVC substrates is an effective economical and eco friendly alternative to prevent Biofilm Formation on PVC Substrates used in water distribution systems.

Biography:

Dr. Ernest David, is Professor and Head of the Department of Biotechnology, at Thiruvalluvar University, in the Fort city of Vellore, Tamil Nadu. He pursued undergraduate education from his native state, Andhra Pradesh, and Postgraduate studies at University of Pune. He obtained his Research Degrees from Sri Venkateswara University, Tirupati, Andhra Pradesh in 1984.

He served as Senior Research Officer at Central Silk Board for two Years. His passion for teaching and research lead to appointment as Assistant Professor at Voorhees College, Vellore from September 1988. He received the "Young Scientist Award" from the Government of Tamil Nadu, in 1994. He also received two grants from University Grants Commission for major research projects. He visited USA, China and Thailand and presented research papers in the Conferences. Eventually he was selected to the post of Professor, at Thiruvalluvar University in May, 2011 where he currently is. He was selected for "Academic Exchange Programme" at Corvinius University, Budapest, Hungary in November, 2011.

He has guided 25 students for Research programmes viz. M.Phil. and Ph.D. and published 75 research papers. In addition to his Academic position, he also holds portfolio as Director, Institutional Quality Assessment Cell at his University.