Pseudomonas stutzeri VR2004 for Green Synthesis of ZnO Loaded Onto a Starch-Gelatine Biopolymer Matrix for Remediation of Xenobiotics in Aquatic Systems

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Today's world, pollution is one of the major causes of the declining quality of the environment. Due to its overall environmental and public health impact, xenobiotics in subsurface environments is a global concern. Several xenobiotics has been found to be carcinogenic, affects hormone signaling causing hypothyroidism and exposure to PFAS (class of xenobiotics) on infancy has been found to attenuate vaccine antibodies. Xenobiotics are not naturally produced in our ecosystem they cannot be recognized by naturally present organisms and therefore do not enter common metabolic pathways. Thus, they are not biodegradable. Currently, methods like ion-exchange separation, electrochemical oxidation, membrane separation are widely used for remediation of polluted waters with xenobiotics but these methods are too expensive to be implemented in small scale industries and all of them produce sludge as a by-product, which has its own disposal problems. due to the advancement in microbiology, bioremediation may seem to be a great option. But, bioremediation has several disadvantages like very high dependency on the environment and consumes longer time to remediate the pollutant. So, here I have developed a novel method for remediation of xenobiotics through loading photocatalytic nanoparticles onto a protein-carbohydrate(gelatine-starch) biopolymer matrix. the method has been found to be superior to the prior methods in the literature.