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Reduction of Selenite to Selenium using Bacteria Isolated from Polluted Areas

Saima Javed^{1*}, Muhammad Faisal¹ and M. Salman Naeem²

¹University of the Punjab, Pakistan

²National Textile University, Pakistan

In this work toxic Selenite which is also highly soluble is transformed to Selenium a less toxic element Selenium through biotic transformation using different strains of bacterial like *Pseudomonas*, *Exiguobacterium* sp, *Bacillus Subtilis* and *licheniformis*. Selenium can exist in different forms like reduced form (Selenide, Se^{2-}), water dissolved form (Selenite, So_3^{-2} /Selenate, SeO_4^{-2}) and in the form of element (Se^0). Different physical parameters were changed for optimizing conditions like different concentrations of Selenium (Se) varying from 200 to 400 and finally to 600 $\mu\text{g ml}^{-1}$, temperature, pH, aeration along with incubation time for high reduction of Selenite. It was found that Selenite reduction rate was increased by increasing pH. It was found that at pH 3 around 15-33% Selenite was reduced and this trend kept on increasing to 28-90% at pH 9. For evaluating optimum temperature for Selenite reduction three levels of temperature were selected (32 °C, 37 °C and 42 °C) were selected. The Selenite reduction was found at different temperatures and the results showed that for optimum reduction of Selenite all strains possess varying preferences. The reduction in Selenite was also checked at different concentrations of Selenite and it was found that maximum reduction of Selenite was observed at lower concentration. This study concluded that in aerobic and anaerobic environment Se can be remediated by using selenite reducing bacteria.

Biography:

Saima Javed is doing Ph.D from University of the Punjab (Department of Microbiology & Molecular genetics). Currently she is working on screening of biosurfactants and their role in oil biodegradation. She has worked in diagnosis of dengue serotypes by molecular techniques and prevalence of Dengue in Pakistan. She has also worked on heavy metals biotransformation, bioremediation, biodegradation, and phytoremediation. In future she is interested to join the group in Pakistan to work for the development of vaccination of Dengue virus.