

Copper tolerant rhizobacteria for sustainable cultivation of rice

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In copper contaminated crop field, the natural role of Copper-tolerant rhizobacteria such as *Bacillus* sp., *Pseudomonas* sp., *Staphylococcus* sp., *Streptococcus* sp. and *Moraxella* sp. in maintaining soil fertility is of much importance. Besides their role in metal detoxification, rhizobacteria also promote the growth of plants by other mechanisms such as production of growth promoting substances and siderophore. In the present study, copper (Cu) tolerant rhizobacteria were isolated from cultivated crop field of Barak Valley Region of Assam. For selective isolation of Cu-tolerant rhizobacteria, nutrient agar was incorporated with cupric sulphate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) and the concentration of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ was maintained at 0.2 mM to 1.0 mM. An overall change in the microbial communities was observed in comparison with the control. The soil physio-chemical properties of the study sites were also performed. The pH range was found to be 4.7 – 5.3, which indicates strongly acidic nature of the soil. On the other hand, a set of pot experiment was performed to determine the deleterious effect of copper on rice field agro-eco system. Most of the rhizobacterial isolates were found to be gram negative. The minimum inhibitory concentration (MIC) and antibiotic sensitivity test of potential gram negative rhizobacteria was determined. Thus, the application of heavy metal tolerant rhizobacteria in contaminated crop field may be a suitable alternative for sustainable cultivation of rice.

Keywords: Copper, rhizobacteria, siderophore, pollutants, tolerant, detoxification

Biography

Mr. Soumitra Nath is a Research Scholar from Bioinformatics Centre, Gurucharan College Silchar under DBT funded project and registered for his Ph.D in Department of Microbiology, Assam University, Silchar (AUS). He has completed his Master degree from Department of Biotechnology, AUS and PG Diploma in Bioinformatics from Department of Life Science, AUS. He has also been appointed as ADHOC-Lecturer in Department of Biotechnology and Bioinformatics Centre of Gurucharan College, Silchar.

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