

As-tolerant P-A strain of *Pantoea ananatis*: a potential PGPR, isolated from the Hezhou mining area in China

Fiza Liaquat

Shanghai Jiao tong University Minhang, China

Abstract:

Microbial and plant assisted bioremediation is an emerging way for the remediation of soils polluted with heavy metals. To screen the arsenic tolerant bacteria, soil samples were collected from Nanjing mining area, China. The average cadmium content of the mine soil reached 45.71 mg/kg, which was indicating serious pollution and potential ecological risk. From the mine soil, six arsenic tolerant plant growth promoting rhizobacteria (PGPR) were isolated. The isolated bacterial strain "P-A" showed maximum arsenic tolerance and it was selected for further experimentation. This strain was identified as *Pantoea ananatis* by 16S rRNA gene sequencing. P-A was found to tolerate maximum arsenic at 2.0 mM concentration. This strain also exhibited good adsorption capacity (up to 45.7%) of heavy metal at 1 mM concentration. Results of this study exhibited organic phosphorus solubilization (37.08 mg/L) and IAA biosynthesis (18.11 mg/L) ability of isolated *P. ananatis*. Scanning electron microscopy (SEM) revealed cell shrinkage and the cell wall of *P. ananatis* became rough at 1 mM arsenic stress. FT-IR study described the differences between functional groups and nature of chemical bonds between and after the absorption of arsenic by *P. ananatis*. At 0.25 mM arsenic concentration, *P. ananatis* treated seeds of *Capsicum annuum* L. developed 2.46 times longer roots than untreated seeds. Results of this study helped us to conclude that P-A strain of *P. ananatis* possesses significant metal tolerance and bioremediation potential against arsenic. In future, this strain can be used as a microbial remediation agent to detoxify heavy metals in contaminated soils.

Biography

Fiza Liaquat is doing PhD in Shanghai Jiao tong University. During her PhD she published 7 research articles as a first author in reputed journals. She also published one patent and developed very good collaboration with other labs and published 6 research articles with Dr. Jianxin Shi of School of Life Science SJTU, Dr. Yidong Zhang of School of Plant Science SJTU, and Dr. M. Farooq Hussain Munis, Quaid-i-Azam University, Islamabad, Pakistan. She also participated and presented her research work in high profile conferences in Chenshan Botanical Garden, Shanghai Forestry Station, Tongji University and Shanghai International Flower Show. She Got the 1st prize in the Shanghai Botany Youth Paper Conference. She Represented SJTU, China as "invited student speaker" in International Conference entitled "Building innovative Pakistan" in Quaid-i-Azam University, Islamabad.

Note : Fiza Liaquat, As-tolerant P-A strain of *Pantoea ananatis*: a potential PGPR, isolated from the Hezhou mining area in China, Journal of Ecology and Toxicology.