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Comparative analysis of 1-aminocyclopropane-1-carboxylate (ACC) deaminase in selected plant growth promoting rhizobacteria (PGPR)

Satendra Singh, Sudha Kumari Yadav, Vadana Das, Gurudayal Ram and Pramod W Ramteke
Sam Higginbottom Institute of Agriculture, Technology and Sciences, India

1-aminocyclopropane-1-carboxylate (ACC) deaminase promotes plant growth by sequestering and cleaving the ethylene precursor ACC to α -ketobutyrate and ammonium. Many plant growth promoting rhizobacteria producing 1-aminocyclopropane-1-carboxylate (ACC) deaminase as a source of nitrogen has an eminent role in plant nutrition. The present work deals with comparative analysis of ACCD producing plant growth-promoting rhizobacteria (PGPR) are *Azospirillum lipoferum*, *Phyllobacterium brassicacearum*, *Pseudomonas fluorescens*, *Francisella tularensis subsp. holarctica OSU18* and *Bacillus cereus*. The sequence and phylogenetic analysis of ACCD producing PGPR species represents the common conserved domain belonging to the tryptophan synthase beta subunit-like PLP-dependent enzymes super family and closely related to each other. The predicted homology models of ACCD of PGPR have similar protein structure with similar folds often share similar function. This analysis represents the evolutionary conservation and same biochemical function of ACCD producing plant growth-promoting rhizobacteria. This analysis is very helpful to understand the biological function of PGPR species.

satendralike@gmail.com

Isolation and PGPR characterization of cadmium resistant strains RAN 1 in cadmium contaminated soil

O P Verma¹, Anjali Tiwari¹, Abha Singh¹ and Manishi Tripathi²

¹Sam Higginbottom Institute of Agriculture, Technology and Sciences, , India

²Chhatrapati Shahu Ji Maharaj University, India

Resistance and tolerance are arbitrarily defined terms frequently interchangeable and after based on weather a given isolate can grow in the presence of selected heavy metal concentration in laboratory media. Total bacterial strains were isolated and screened on the basis of their heavy metal tolerance ability for cadmium and their PGPR activity. It was estimated that they have good tolerance power for cadmium the heavy metals and are plant growth promoting rhizobacteria. If we study morphological aspects we can say that gram negative rods are more efficient in tolerating heavy metals. By performing different PGPR test it was proved that the isolated strains have PGPR activity can be used as biopesticides and biofertilizers. At pH 7 and 28o C temperature strain RAN 1 is resistant to heavy metal but at pH 9, the growth is inhibited in presence of heavy metal. There were high growth rate of strain RAN 1 at 28o C. Strain RAN 1 is grow at neutral and alkaline pH also but in presence of heavy metal growth is decreased. In presence of heavy metal, strain RAN 1 increased the root and shoot length as well as fresh and dry weight also. So, the microbes isolated from RAN1 that must have good tolerance power and developed resistance mechanism for their survival and thus can be helpful in bioremediation.

om.verma@shiats.edu.in