

Functional Diversity of Pseudomonas: Role in Stimulation of Bean Germination and Common Blight Biocontrol

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Abstract : Description of the subject: Currently, several efforts focus on the study of biodiversity, microbial biotechnology, and the use of ecological strategies. Objectives: The aim of this present work is to determine the functional diversity of bacteria in rhizospheric and non-rhizospheric soils of different plants. Methods: Bacteria were isolated from soil and identified based on physiological and biochemical characters and genotypic taxonomy performed by 16S rDNA and BOX-PCR. As well as the characterization of various PGPR traits. Then, they are tested for their effects on the stimulation of seed germination and the growth of *Phaseolus vulgaris* L. As well as their biological control activities with regard to the phytopathogenic bacterial isolate Xapf. Results and Discussion: The biochemical and physiological identification of 75 bacterial isolates made it possible to associate them with the two groups of fluorescent *Pseudomonas* (74.67%) and non-fluorescent *Pseudomonas* (25.33%). The identification by 16S rDNA of 27 strains made it possible to attribute the majority of the strains to the genus *Pseudomonas* (81.48%), *Serratia* (7.41%) and *Bacillus* (11.11%). The bacterial strains showed a high capacity to produce IAA, siderophores, HCN and to solubilize phosphate. A significant stimulation of germination and growth was observed by applying the *Pseudomonas* strains. Furthermore, significant reductions in the severity and intensity of the disease caused by Xapf were observed. Conclusion: The bacteria described in this present study endowed with different PGPR activities seem to be very promising for their uses as biological control agents and bio-fertilization.

Keywords : biofertilization, biological control, *phaseolus vulgaris* L, *pseudomonas*, *Xanthomonas axonopodis* pv. *phaseoli* var. *fuscans* and common blight

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