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## Differential expression of phosphatases in legumes' nodules as molecular traits tolerance to phosphorus deficiency

**Mohamed Lazali**

University of Khemis Miliana, Algeria

Symbiotic nitrogen fixation (SNF) by legumes may provide an ecologically acceptable complement or substitute for mineral nitrogen fertilizers that farmers cannot afford for economic limitation or try to minimize for environment sake. However, P-deficiency is a major limiting factor for legume-rhizobia symbioses, particularly in acidified or calcareous soils. Nevertheless, the legume SNF potential and expression under P-deficiency may be improved. In this study we have compared the expression of various phosphatases (APases) in nodules of common bean recombinant inbred lines (RILs) that were previously selected for their contrast in P use efficiency for SNF. In order to assess the contribution of APases activity to P use efficiency for SNF in legume nodules, an in situ RT-PCR methodology was used to localize and quantify the transcripts of candidate APases genes in nodules of two *Phaseolus vulgaris* RILs in hydroaerobic culture under deficient vs sufficient P supply.

Our findings have revealed that the transcript localization of phytase, phosphoenol pyruvate phosphatase, fructose 1,6 bisphosphatase and trehalose 6P phosphatase was found to be tissue specific and to differ among APase genes, P treatment and legume genotype. The expression of these genes was positively correlated with increases both of the rhizobial symbiosis efficiency in use of P for N<sub>2</sub> fixation and nodule O<sub>2</sub> permeability. Under P-deficiency, this positive correlation was more significant for the RIL115 that is tolerant to P-deficiency than the sensitive RIL147. It is concluded that these APases contribute differently to the use of organic P for N<sub>2</sub> fixation and play a role in adaptation to P-deficiency.

### Biography

Mohamed Lazali is a Professor and the Director of the Research Laboratory, Faculty of Nature, Life and Earth Sciences, University of Khemis Miliana, Algeria. His teaching activities have been focused predominantly on plant and agricultural biotechnology. He did his postdoctoral research at INRA France. He has published more than 25 research articles and book chapters. My research aims to investigate nutrient dynamics at the rhizosphere scale with particular focus on the possible links between nutrient use efficiency and yield stability of legume-non-legume cropping system to single or combinations of abiotic stresses.