Agri-2014

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Agricultural & Horticultural Sciences

February 03-05, 2014 Hyderabad, India

Soil fertility escalation and fertilizer phosphorus saving by consortium of *Burkholderia* species in context with sugar beet

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Abstract

Soil fertility is coupled with number of microorganisms present and their activities in soil. In the present investigation, a pot culture experiment with factorial completely randomized design (FCRD) was performed to evaluate the impact of a lignite based bioinoculant (VIMP) containing consortium of four phosphate solubilizing species of *Burkholderia* viz., *Burkholderia cenocepacia* strainVIMP01(JQ867371), *Burkholderia gladioli strain* VIMP02 (JQ811557), *Burkholderia gladioli strain* VIMP 03 (JQ867372) and *Burkholderia species strain* VIMP 04 (JQ867373) isolated from sugarcane and sugar beet rhizosphere, on enzyme activities, CO_2 evolution rate and available phosphorus in sterile and nonsterile soil along with or without sugar beet. The highest soil acid and alkaline phosphatase activities were recorded on 90 DAS while the highest soil urease and dehydrogenase activities were recorded on 30 and 60 DAS respectively. Soil microbial activities were recorded at the highest level by the treatment of nonsterile soil + VIMP + sugar beet in combination where the level of available phosphorus was found to be increased substantially by 87.63% and 115.14% as compared to sterile soil alone and nonsterile soil alone control treatments, respectively. Effects of graded levels of phosphorus fertilizer viz. 50%, 75%, 100% RDF with or without bioinoculant VIMP on yield and phosphorus uptake of sugar beet under field trial were also studied using factorial randomized block design (FRBD). The yield and phosphorus uptake of sugar beet recorded by the treatment 75% P_2O_5 + VIMP were found at par with results of treatment 100% P_2O_5 + VIMP.

Biography

Shrikumar V. Mahamuni has completed his Ph.D at the age of 39 years from Pune University. He is the Assistant Professor in Microbiology, at the Pune University affiliated Shardabai Pawar Mahila College, Malegaon Bk., Baramati. He has 18 years of teaching experience and published 03 papers in reputed journals.