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Juliana Morales Rodríguez et al., J Virology & Antiviral Research 2018, Volume 7
DOI: 10.4172/2324-8955-C2-009

World Congress on
VIROLOGY, MICROBIOLOGY AND MICROBIOLOGISTS
November 19-20, 2018 Orlando, USA

Organic phosphorus mineralization and phytase activity by fungi isolated from coffee plants rhizosphere

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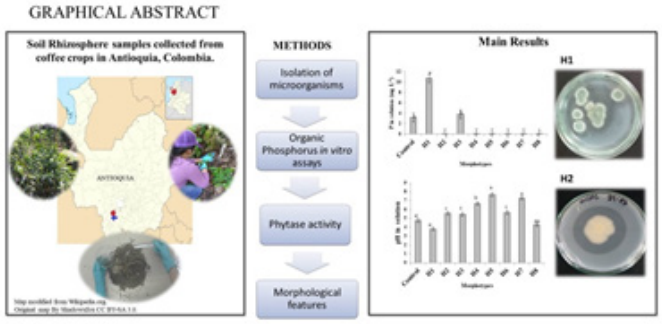
The coffee industry has a big importance in the Colombian economy, in the coffee zone prevails soils with low disponibility of phosphorus (P), it is an essential nutrient for plant growth, in order to correct this problem it is necessary to apply big quantities of chemical fertilizers, causing high production costs and environmental damage. The organic P is between 30% and 70% of the total P in agricultural soils, it has been reported that approximately the half of the microorganisms in soil associated to the plants' rhizosphere have the capacity of mineralizing organic phosphates. The aim of this work was to isolate microorganisms associated with rhizosphere of coffee plants with the ability to mineralize organic P and to evaluate their phytase activity. Soil rhizosphere samples were collected from coffee crops located in two towns in Antioquia, Colombia. For isolation of microorganisms, it was done serial dilutions until 10-6 and they were plated by duplicated on selective solid medium in order to detect phytase producers. After to select more promising fungi, they were evaluated by *in vitro* assays with medium supplemented with wheat bran and their enzymatic activity was measured according to Lee et al. (2005) with modifications. In total 13 microorganisms were found in the analyzed samples and 8 fungi were selected to later assays. One fungus (*Penicillium sp*.) showed the ability to mineralize organic P and five fungi presented phytase activity. Two of these fungi have been selected to carry out additional greenhouse trials, which are in course. This is the first study of organic P mineralizers present in coffee crops and it is very important due to the use of these microorganisms could be an alternative to enhance the plant nutrition and a solution to the over-fertilization of P in coffee and other crops.



Biography

Juliana Morales Rodriguez is a Biological Engineer of the National University of Colombia and currently pursuing Master of Sciences in Biotechnology.

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