Abstract Details

Title: **The role of common bean rhizosphere bacterial communities on phosphorus mobilization**

Authors: Josiane Barros Chiaramonte - *University of São Paulo*, *Brazil**; Davide Bulgarelli - *University of Dundee/The James Hutton Institute*, *Scotland*; Lilian S Abreu S Costa - *Embrapa Meio Ambiente*, *Brazil*; Maike Rossman - *Embrapa Meio Ambiente*, *Brazil*; Rodrigo Mendes - *Embrapa Meio Ambiente*, *Brazil*

Session: C1. Rhizosphere - St Olof Chapel, 20/02/2018, 09:00 - 10:00

Time: 09:15 - 09:30

Acid soils are known for their high phosphate fixation potential, leading to an overage application of fertilizers. Microorganisms play important role in nutrient availability in the rhizosphere helping plants with phosphorus mobilization and uptake. We hypothesize that less efficient cultivars in phosphorus uptake, insoluble sources of phosphorus and limiting conditions of phosphorus in the soil could enrich the rhizosphere microbiome related to the availability of this nutrient. We performed a completely randomized factorial experiment with two common bean cultivars contrasting in phosphorus uptake efficiency growing in triple superphosphate or rock phosphate gradients. Sequencing of 16S rRNA amplicons were performed to access the rhizosphere community structure. The variation in bacterial community structure occurred mainly due to cultivar effect and the interaction of cultivar and levels of phosphate tested. However, while in the cultivar inefficient in phosphate uptake the rhizosphere responded to the source and levels of phosphate tested, in the efficient cultivar the bacterial community structure responded only to the sources of phosphate applied. Differential analysis showed that in phosphorus limiting conditions mainly the orders Micrococcales, Burkholderiales, Rhizobiales, Bacillales are enriched in the rhizosphere of the inefficient cultivar as well as the functions involved in lipopolysaccharide biosynthesis and bacterial secretion system. Network analysis showed that the rhizosphere of this cultivar also showed more interconnected community than the efficient cultivar. These findings suggest that the cultivar inefficient in phosphorus uptake relies on its microbiome when compared to the efficient cultivar, and recruit a rhizosphere microbiome enriched with functions related to P mobilization.