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Diversity of rhizobacteria encoding phosphatase gene from Chilean extreme environments

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Bacterial communities associated with roots (rhizobacteria) carry out functions that are essential to plant nutrition in terrestrial ecosystems. Rhizobacteria that inhabit extreme environments regions produce enzymes adapted to those environments. The goal of this study was to evaluate the diversity and abundance of phosphatase-producing rhizobacteria from Chilean extreme environments. We analyzed rhizospheres samples from Atacama Desert, Quetrupillan volcano Maluil-malal sector from Lanín volcano, natural hot spring from Liquiñe, Patagonia and Antartic. Our results showed that significant differences in the presence of dominants bands were observed in samples from Atacama Desert and Patagonia in relation to samples from La Araucanía and Los Ríos. According to these differences, UPGMA clustering analysis revealed the existence of three major groups with a similarity of 40% for Patagonia and Antarctic following by La Araucanía and Los Rios region and finally Atacama Desert. Occurrence of 16S rRNA copies was high in samples from La Araucanía and Los Rios region, whereas soils from zones geographically differentiated such as; Atacama Desert, Patagonia and Antarctica shown less copies to constitutive 16S rRNA from bacterial communities. Genotyping across ERIC-PCR was a validate method for evaluate genetic diversity between strains with the similar phenotypes. In our study, the 6 sampling sites along with Chilean extreme ecotypes have shown a high diversity of genotypes (ranging from 29% to 66% of different genotypes). This study showed that Chilean ecosystems contains a wide rhizobacterial diversity and highlight our limited knowledge of their ecology, interaction with plants and their potential as plant growth promoting rhizobacteria based on the production of phosphatase.

Biography

Jacquelinne Acuna has completed her PhD from La Frontera University of southern of Chile. She is working in the microbial ecology, plant-microbe interaction and biotechnology of microorganisms. She is a Post-doctoral Researcher in the Center of Plant, Soil Interaction and Natural Resources Biotechnology, Scientific and Biotechnological Bioresource Nucleus from La Frontera University.

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