

October 29-30, 2018
Budapest, HungaryMariusz Cycon et al., Expert Opin Environ Biol 2018 Volume: 7
DOI: 10.4172/2325-9655-C7-037

METABOLIC PATTERN OF MICROBIAL COMMUNITIES IN SOIL TREATED WITH CLINDAMYCIN AND/ OR INOCULATED WITH A MULTIDRUG RESISTANT PROVIDENCIA RETTGERI STRAIN MC2 BASED ON THE COMMUNITY-LEVEL PHYSIOLOGICAL PROFILING (CLPP)



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Among the antibiotics belonging to the class of lincosamides, clindamycin (CM) is most frequently prescribed in many European countries. Due to the fact that conventional wastewater treatment plants remove CM from wastewater partially, this antibiotic and antibiotic resistant bacterium is introduced into soils through the agricultural usage of sewage sludge and may affect the metabolic activity of the soil. To ascertain this impact, the community level physiological profiling (CLPPs) using the Biolog[®] EcoPlate[™] system in the CM (CM1-1 mg/kg and CM10-10 mg/kg) and/or antibiotic resistant *Providencia rettgeri* strain MC2 (Pr-1.6×10⁷ cells/g) treated soils were determined during a 90 day experiment. A multifactorial analysis and the resistance (RS)/resilience (RL) concept were used to assess the potential of native microorganisms to maintain their catabolic activity under exposure of CM and/or a high level of *P. rettgeri*. The results revealed a negative impact of CM on the metabolic activity of soil microorganisms, especially on days 1-30 as shown by a decrease in the values of the CLPP indices, i.e. the average well-color development (AWCD), substrate richness, Shannon-Wiener index as well as the AWCDs for the six group in which the 31 carbon substrates were grouped (i.e. amines, amino acids, carbohydrates, carboxylic acids, miscellaneous and polymers). In turn, an increase in the metabolic activity of soil microorganisms was observed at the same time after the addition of the bacterial strain. These observations suggested a low initial resistance of soil microorganisms to CM and/or strain MC2. Although the negative effect of CM was transient, the application of this antibiotic into soil may temporarily pose a potential risk for soil functioning

Biography

Mariusz Cycon has received his PhD in (Environmental Microbiology in 2014, PhD in Medical Biology in 2006 and MSc in Biotechnology of Plants and Microorganisms in Jul' 2006. He has experience in different areas of modern environmental microbiology and biotechnology. He has published research articles in national and international peer-reviewed journals. He is a Member of the Editorial Board of many journals and has so far reviewed more than 470 articles for 88 high rated journals.

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