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Native soil organic matter conditions the response of microbial communities to organic inputs with different stability

Ibrahim H. Yanardağ (2), Raúl Zornoza (1), Felipe Bastida (3), Asuman Büyükkiliç-Yanardağ (2), Jose A. Acosta (1), Carlos García (3), Ángel Faz (1), and Ahmet R. Mermut (2)

(1) Universidad Politécnica de Cartagena, Agronomy School, Cartagena, Spain (raul.zornoza@upct.es), (2) Harran University, Department of Soil Science and Plant Nutrition, Faculty of Agriculture, Sanliurfa, Turkey, (3) CEBAS-CSIC, Centro de Edafología y Biología del Segura, Consejo Superior de Investigaciones Científicas, Campus Universitario de Espinardo, Espinardo, Murcia, Spain

The response of soil microbial communities from soils with different soil organic matter (SOM) content to organic inputs with different stability is still poorly understood. Thus, an incubation experiment was designed to study how the addition of pig slurry (PS), its manure (M) and its biochar (BC) affect soil microbial community and activity in three soils differing in SOM content (Regosol, Luvisol and Kastanozem). The evolution of different C and N fractions, microbial biomass C and N, enzyme activities and microbial community structure by the use of phospholipid fatty acid (PLFA) analysis was assessed for 60 days. Results showed that the different amendments had different effect on microbial properties depending on the soil type. The addition of M caused the highest increase in all microbial properties in the three soils, followed by PS. These changes were more intense in the soil with the lowest SOM (Regosol). The addition of M and PS caused changes in the microbial community structure in all soils, which were more related to the presence of available sources of N than to the labile fractions of C. The addition of BC was followed by increases in the proportions of fungi and Gram positive bacteria in the Regosol, while enhanced the proportion of actinobacteria in all soil types, related to increments in pH and soil C recalcitrance. Thus, native SOM determined the response of microbial communities to external inputs with different stability, soils with low SOM being more prone to increase microbial biomass and activity and change microbial community structure.