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DIVERSITY OF SOIL BACTERIA AS INDICATOR OF SOIL POLLUTION IN MOLDAVIA REGION, ROMANIA

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Abstract

To evaluate the effects of seasonal fluctuations, soil types, land use and management inputs on the abundance and composition of soil bacteria, twenty soils types from Moldavia region located in north-eastern Romania were compared. Changes in soil microbiota are an early and sensitive indicator of soil pollution and can be used to predict long-term trends in soil quality. The use of microbial properties as indicator of soil pollution is easily measured and can also be measured accurately across a wide range of soil types and conditions. The dynamics of the bacterial community from all soil types were ranked as follows: spring 2012 (164.8×10^6 CFU g⁻¹) > spring 2013 (147.7×10^6 CFU g⁻¹) > autumn 2012 (80.6×10^6 CFU g⁻¹) > autumn 2013 (79.4×10^6 CFU g⁻¹). In case of land use and soil management practices (conventional, organic, and unmanaged) the bacterial abundance increased in the following order: vineyards < permanent grassland < arable land under crop rotation < hardwood forest < vegetable crop < hay crop. Our results suggest that seasonal variation, land use and soil management have a significant impact on bacterial richness and diversity ($p < 0.05$ in all cases). Extensive use of xenobiotic compounds in agriculture degrades soil microbial communities as they affect microbial abundance and composition, directly, and soil texture and fertility, indirectly.

Key words: land use soil management, seasonal variation, soil bacteria, soil health, soil type

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