



Comparison of two farming systems by soil metabolic activity profiles

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To sustain soil quality and biodiversity, new approaches of farming system should be developed. One of these is the organic land management that exclude the use of mineral fertilizers. Our goal in the present work was to compare conventional and organic farming systems at three sites situated in different soil types in two seasons. We supposed that physiological profile of soil microbial communities would differ between the two different land managed soils and remain distinct in two separated seasons.

Catabolic activity profile of the soil microbial community was compared at three sites (Martonvásár, Karcag and Nyíregyháza) in Hungary having different texture, a loam, a clay, and a sand with organic and conventional farming systems in two seasons (autumn and spring). MicroResp™ method with 23 different substrates (simple sugars, amino acids and carboxylic acids) were used. We measured the colorimetric detection of microplate after short-term incubation from substrate enriched soils. According to the principal component analysis (PCA), the spring soil samples from conventional and organic managed farming from three soil type were clearly separated, in contrast they were only partially separated in autumn. The summary of Similarity Percentages test (SIMPER) indicated the order of importance that responsible for group separation were malic acid, citric acid and glucose in autumn, while citric acid, malic acid and glucose in spring. The substrate utilization pattern of the soil microbial communities was different depending on seasons, soil type, farming systems and crops. Soil pH, AL-P2O5, AL-K2O can affect significantly the rate of CO₂ evolution and the respiration pattern of samples by added different substrates.

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