

A REVIEW ON ASSESSING MICROBIAL FUNCTIONAL DIVERSITY IN ARABLE SOILS BY USING MICRORESP™ METHOD

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Introduction. The microbial community is considered the driver of many soil functions, playing key roles in aggregate formation, nutrient mineralisation, plant health and is considered the basis of food webs in soils. Agricultural practices can change soil properties and thus can have an important impact on soil microbial community and related processes. Community level physiological profiles (CLPP) have been widely used to assess microbial community diversity in arable soils. Refinement of techniques to assess soil CLPP led to the development of the MicroResp™ technique.

Aims. Use of this technique has many advantages but some drawbacks are also discussed. In this context, we have conducted a review study about using MicroResp™ method to assess the functional diversity in arable soils.

Materials and Methods. By using of „microresp” as keyword 94 scientific papers was selected from Web of Science data base. The papers were analyzed and grouped into four categories according to the following criteria: modifications and adaptations of the MicroResp™ method, effects of tillage and fertilization on the soil microbial community and changes in soil functional diversity induced by soil properties. From the total selected papers, 54 were chosen for the final evaluation.

Results. Besides the advantages, the MicroResp™ method also has some limitations: the required amount of soil relatively small, the size of the soil aggregates used (<2 mm), errors related to the measurement of the amount of CO₂. The results obtained by different authors highlight the main factors that affects CLPP: the heat-drought disturbance, soil type, soil pH, soil moisture. It is also discussed that organic soil management has positive effects on microbial functional diversity while conventional tillage do not reduce functional diversity when is compared with minimum tillage.

Conclusion. MicroResp™ method used to measure CLPP could be considered as an appropriate method for the assessment of the changes induced by different agricultural practices on microbial functional diversity of arable soils.

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