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“GLOBAL CHALLENGES THROUGH THE PRISM OF RURAL
DEVELOPMENT IN THE SECTOR OF AGRICULTURE AND
TOURISM“



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AGRICULTURE

MICROBIAL COMMUNITIES AS INDICATORS OF SOIL FERTILITY IN ARABLE LANDS OF VOJVODINA PROVINCE

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ABSTRACT

Soil microorganisms play a significant role in agroecosystems via decomposition and nutrient cycling and may serve as indicators of potential soil fertility and land-use change. Cultivation practices lead to disturbance of soil properties, which is manifested by a reduced number and enzymatic activity of microorganisms, especially because modern agricultural production involves the use of large amounts of pesticides and fertilizers, the non-application of organic fertilizers, and the burning of crop residues. The aim of this study was to determine the abundance of certain microbial groups and dehydrogenase activity in arable lands of Vojvodina Province according to the humus gradient, which is one of the most important characteristics of soil fertility. Microbiological properties and humus content have been determined in 1115 representative soil samples collected from the surface horizon (0–30 cm). The highest total number of bacteria, oligotrophs, copiotrophs, and fungi, as well as dehydrogenase activity, were recorded in soil samples with a high content of humus (5–10%). Similarly, the azotobacters and actinomycetes were the most abundant in medium-humus soil samples (3–5%), whereas the lowest microbial number and activity were detected in soil samples with very low humus content (<1%). The results indicate the necessity of applying good agricultural practices that will enable intensive microbiological activity and the synthesis of new amounts of humus, primarily through the introduction of organic matter into the soil as well as the use of microbial-based preparations.

Keywords: arable land, humus content, microbial activity, microbial number, soil fertility.



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