PHOSPHATASE ACTIVITY OF TYPICAL CHERNOZEM SOIL IN FIELD CROP ROTATION

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Abstract
Soils of the Republic of Moldova are characterized mostly by a low content of mobile phosphorus. In the context of sustainable agriculture restoration and maintenance of soil fertility has become a key problem. The main role in the process of phosphorus mineralization in the soil, from organic compounds, belongs to orthophosphoric monoester phosphohydrolases (phosphatases). The aim of this research was the assessment of phosphatasic activity in soil, depending on the system of fertilization and crop type. The long-term field experiment (since 1972) is located in Balti steppe, RM, on the typical chernozem soil. The results of comparative analysis of phosphatasic activity (acid – pH 5.0, natural – un-buffered conditions and alkaline – pH 10.2) are presented. The extracellular activity was determined by soil incubation with toluene, and with disodium p-nitrophenyl phosphate hexahydrate salt as the substrate. The soil samples were collected under the following crops: vetch + oats, winter wheat and sugar beet, which are a part of a field crop rotation. Three fertilization systems were analyzed: mineral, mineral + organic, organic and control – un-fertilized soil.
The investigation results revealed that in all examined treatments, the phosphatasic activity determined under conditions of natural soil pH had higher values than those of acid and alkaline ones. Phosphorus mineralization process went more intense in variants with organic fertilization. The soil enzymatic activity under the sugar beet was lower than in the soil collected under the vetch + oats and winter wheat.
Key words: typical chernozem, field crop rotation, organic fertilization, soil phosphatasic activity

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