

BIOTA OF XEROPHYTE-FOREST CHERNOZEM UNDER DIFFERENT LAND USES

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Abstract

The influence of different land use management on the modification of biological properties of the xerophyte-forest chernozem located in the southern zone of the Republic of Moldova has been investigated. The long-term arable chernozem was compared to the virgin soil under forest. The xerophyte-forest chernozem in the natural ecosystem is characterized by the favorable physical and chemical properties and is ideal standards in regard to the composition, biomass and activity of the biota. A characteristic feature of the natural xerophyte-forest chernozem is the high concentration of invertebrates and *Lumbricidae* family in the upper layers of soils and in the litter. Saprophages prevail in the composition of the edaphic fauna in the virgin chernozem under forest, accounting for 90.8% of the total abundance. Six families and seven species of invertebrates were found in the virgin chernozem. The concentration of microorganisms in the top layer reaches $521.1 \mu\text{C g}^{-1}$ soil. The abundance and reserves of biota and the humus content in soil profiles decreased with its depth. The microbial biomass was connected with the humus content and amounts of agronomic valuable aggregates. Prolonged use of the chernozem in the agricultural production led to the destruction of soil structure, reduction of humus content and contributed to the degradation and decrease of soil biota stability. The negative effects on soil biota were observed as a result of mineralization processes and long-term land management practices without of organic fertilizers. A land management with the fallow areas is recommended for the regeneration of the edaphic fauna and microorganisms and the natural restoration of the quality of xerophyte-forest chernozems.

Key words: soil biota, xerophyte-forest chernozem, land management, degradation
