Abstract

The content, reserves and profile distributions of microbial biomass in the different soil types and subtypes of the Republic of Moldova have been investigated in the connection of the soil carbon sequestration and environmental protection. Sampling was carried out in 11 profiles per soil horizons to a depth of 170 - 200 cm and from 0 - 30 cm layer separately. Database was evaluated statistically by the variance and correlation analysis. The negative effects on soil microbial biomass were observed as a result of erosion processes and long-term land management practices without of organic fertilizers. The content and reserves of microbial carbon in soil profiles decreased with its depth. The reserves of microbial biomass in virgin and fallow soils were 5.9-12.7 t ha^{-1}, in arable soils with the normal profile – 3.6-7.2 t ha^{-1}, in eroded arable soils – 1.6-1.9 t ha^{-1} in the 0 - 100 cm layer. The microbial biomass was connected with the humus content and amounts of agronomic valuable aggregates. Correlation coefficients constitute 0.58-0.97 and 0.86 respectively. The significance of microorganisms in the formation of the water-stable structure in soils is discussed. The organic farming system with the application of 50 t ha^{-1} of manure and green manure crops returns the organic matter to the soil and creates conditions for the carbon stock. The microbial carbon content in the arable layer of the leached and ordinary chernozem increases by 1.5 times. The use of organic fertilizers has been recommended for the restoration of the microbial communities and improvement of carbon fluxes into degraded soils.

Key words: microbial biomass, soil, carbon, humus