

# ENZYMATIC ACTIVITY AS AN INDICATOR OF THE DEGRADATION AND ENVIRONMENTAL SUSTAINABILITY OF SOILS OF THE REPUBLIC OF MOLDOVA

Irina SENICOVSCAIA<sup>1</sup>

[irina\\_sen@mail.ru](mailto:irina_sen@mail.ru)

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## Abstract

Modifications of the enzymatic activity of soils of the Republic of Moldova as a result of their long-term arable use, the application of high doses of fertilizers, the use of saline waters for irrigation and the impacts of erosion processes have been established in present research. The database of enzymatic activities of different zonal soils in the long-term field experiments has been developed and constantly updated with a view to the operative evaluation of the degradation processes and ecological effectiveness of the land management. Sampling was carried out in profiles per soil horizons and from 0 - 30 cm layer separately. Database was evaluated statistically by the variance and correlation analysis. The current status of the enzymatic activity of arable soils of the Republic of Moldova is characterized by the significant reduction in comparison with soil's standards that are in conditions of natural ecosystems. Enzyme activities in soil profiles decreased with depth and depended of the soil type, fertilizers doses and the form of farming system. The negative effects on soil enzymatic activity were observed as a result of erosion processes and long-term land management practices without organic fertilizers. Losses of the urease constitute 68.6-94.3%, dehydrogenase – 19.1-55.6%, polyphenoloxidase – 6.5-32.8%, peroxidase – 10.9-28.7%, in the dependence of the erosion degree. The scales of enzymatic indicators that are proposed to use for the evaluation of the degree of chernozems degradation and its environmental certifications have been developed. The optimal doses of fertilizers and ameliorants for the recovery of the enzymatic potential of degraded soils and for the improvement of the soil quality and of the environment have been established.

**Key words:** enzymatic activity, enzyme, soil, degradation, scale

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