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## Distribution of "Molnia" pesticide along soil profile and its influence on soil organisms

Galitskaya P., Mamaeva E., Biktasheva L., Selivanovskaya S.  
*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

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### Abstract

In this study, influence of "Molnia" insecticide (active agent lambda-cyhalothrin) widely used in Russia and many European countries was investigated. Using several microbial parameters (microbial biomass, basal respiration, urease and dehydrogenase activities) and *Avena sativa* root elongation inhibition, effects of migration of pesticide along soil profile in short time period (3 months) was estimated. It was shown, that microbial biomass is higher sensitive to pesticide presence than microbial basal respiration. Digging of the soil which lead to its aeration changed the reaction of microbes on pesticide presence, in both, increasing and decreasing sides. Urease activity was sensitive to "Molnia" pollution while cellulase activity did not change significantly after pollution. The most biological parameters analyzed decreased from the upper (0-20 cm) to the lower (40-60 cm) soil layers which was connected with organic carbon and oxygen content. *Avena sativa* roots were significantly inhibited (21%) in the middle layer of pesticide polluted digged-up soil whereas it was equal to the corresponding control value in the non diggedup polluted soil. This is due to higher migration ratio of the pollutant into the digged-up soil. In three years of experiment, the quality of polluted soil slightly restored, that can be explained by degradation of the pesticide.

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### Keywords

Agricultural soil, Leakage of pollutants, Microbial parameters, Pesticide, Phytotoxicity, Soil restoration