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THE EFFECT OF MANGANESE, NICKEL AND LEAD IONS ON LDH ACTIVITY OF THE *PROCAMBARUS VIRGINALIS* (LYKO, 2017)

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Introduction. The marbled crayfish *Procambarus virginalis* (Lyko, 2017) (Decapoda) – new alien species, that got into the reservoirs of the Dnipropetrovsk region in 2015, it was necessary to study the possibilities of its adaptation to environmental factors of reservoirs for further prediction of its distribution or even acclimatization under conditions of toxicological contamination of the ponds of Ukraine. The disturbance of vital functions of hydrobionts living in changed conditions is precisely at the biochemical level. As an indicator of the stress, LDH activity is used to biomark the physiological state of animals, the potential pollution of the reservoirs. The working hypothesis of the study was based on determining the reaction of marble crayfish to the influence of the simulated concentrations of nickel, manganese and lead ions under controlled conditions.

Methods. Crayfish were divided into 4 groups (n = 15): 1st – control; 2nd – with $Ni(NO_3)_{2x}6H_2O$; 3rd – with $Pb(NO_3)_2$; 4th – with $MnSo_{4x}5H_2O$ (Sigma, USA). Water in aquariums was completely changed twice a week and toxicants were added at the rate of concentrations of metal ions: Ni^{2+} – 0.04 mg/l (4 MAC), Pb^{2+} – 0.15 mg/l (1.5 MAC), Mn^{2+} – 0.02 mg/l (2 MAC). Concentrations of heavy metals were determined by their content in water of Zaporizhzhya reservoir as control, the main recipient reservoir for this new species. The experiment lasted 21 days. The activity of lactate dehydrogenase (LDH) was determined using standard commercial sets LDH (Filisit Diagnostika, Ukraine) on a spectrophotometer SP-26 at a wavelength of 340 nm. There liability of the difference between data samples was determined using one-factor ANOVA ($P < 0.05$).

Results. On the 21st day of the experiment in the lead aquarium 26.7% of crayfish were dead. In the nickel experiment, crustacean mortality was the highest and reached 60.0%. It was found that the activity of LDH increased by 29.6 and 32.3%, during the effect of Mn^{2+} and Ni^{2+} on the tissues of marmorkrebs. In the control group, LDH activity was 48.04±4.03 NADH/mg. The influence of Mn^{2+} increased the activity of lactate dehydrogenase up to 67.23±5.69 NADH/mg, and the influence of Ni^{2+} increased it up to 69.84±2.1 NADH/mg. The influence of Pb^{2+} also showed improbable changes by 15.6% in the activity of the enzyme. The activity of LDH under the influence of lead was at the level of 56.23±4.46 NADH/mg.

Conclusions. Functional activity of LDH increases with poisoning marbled crayfish with heavy metals, when inhibiting tissue respiration. The growth of LDH activity leads to increased utilization of lactate by various tissues, with the urgent need with tissue damage by toxic factors. The rate of utilization of lactate by different tissues indicates the biochemical plasticity of *P. virginalis* to adverse conditions of existence. These processes contribute to the survival of resistant species of hydrobionts under toxicologically hard conditions.