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CHANGES OF SUPEROXIDE DISMUTASE AND CATALASE ACTIVITY IN RED BLOOD CELLS OF RATS EXPOSED TO CHLORPYRIFOS

V. P. Rosalovsky, Ph.D. student
ros.volodymyr@gmail.com
Institute of animal biology NAAS

Due to its component composition and buffer capacity, blood plays an important role in the ion balance regulation and homeostasis. As the red blood cells are the main component of blood, there is interest in the superoxide dismutase (performing dismutation of superoxide anion into Oxygen and Hydrogen Peroxide) (EC 1.15.1.1). and catalase (splitting of hydrogen peroxide into water and molecular oxygen) (EC 1.11.1.6). Since these enzymes are involved in the maintenance of prooxidant-antioxidant status, the violation of which could be caused by xenobiotics, including chlorpyrifos, their study is very relevant.

The aim of the study was to investigate the dynamics of changes in the superoxide dismutase and catalase activity in rat blood during the first hour after chlorpyrifos intoxication. For this purpose, 50 white male Wistar rats were divided into 5 groups: control (C) and 4 experimental (D1, D2, D3, D4), of 10 animals each. Experimental animals were exposed to fresh chlorpyrifos solution (50 mg / kg) via the oral probe, and control animals received an equivalent amount of oil. Decapitation and sampling of biological material was performed at 15 (D1), 30 (D2), 45 (D3), 60 (D4) min. after injection. Superoxide dismutase and catalase activity was assessed in erythrocytes hemolysate.

We found decrease in the catalase activity at 15, 30, 45 minutes of experiment, with a minimum value at 30th minute of the experiment and a gradual increase to control values in the group D4. Superoxide dismutase activity increased in all experimental groups. The peak of the superoxide dismutase activity was observed in group D2. In other groups, superoxide dismutase activity was higher than the control value, with small intergroup differences. We investigated that in dose of 50 mg/kg chlorpyrifos causes changes in enzymatic activity of catalase and superoxide dismutase in rat red blood cells during the first hour after exposure.