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EFFECT OF ETHYLTHIOSULPHANILATE ON THE ENZYMATIC ACTIVITY OF ALKALINE PHOSPHATASE IN RAT BLOOD PLASMA UNDER THE TOXIC EFFECT OF CR(VI)

Kotyk B.I., postgraduate student, Institute of Animal Biology NAAS, Lviv, Ukraine
ORCID: https://orcid.org/0000-0002-3414-1624
Iskra R.Ya., doctor of biology, professor, Ivan Franko National University of Lviv, Lviv, Ukraine
ORCID: https://orcid.org/0000-0001-7248-548X

The active use of Cr(VI) compounds in the industrial sector contributes to its spread in the environment and poisoning of organisms. Cr(VI) is a heavy metal and a powerful pro-oxidant that causes disruption of cellular metabolism by hyperproducing reactive oxygen species (ROS) and impairing the functions of antioxidant defense system (ADS) enzymes [1]. Cr(VI)-induced oxidative stress leads to activation of apoptosis and necrosis in hepatocytes [2]. Alkaline phosphatase (ALP) belongs to a group of enzymes that regulate cellular metabolism by cleaving phosphate residues from protein and nucleotide molecules at alkaline pH [3]. An increase in the activity of ALP under the influence of Cr(VI) is an indicator of hepatotoxicity [4, 5]. Antioxidants inhibit the prooxidant effect of Cr(VI) by supplying their own electrons with subsequent reduction of Cr(VI) to Cr(III) [130]. Ethylthiosulfanylate (ETS) is an organosulfur synthetic compound of the thiosulfonate class. The antioxidant effect of ETS contributes to the normalization of the ADS status in liver tissue under the toxic effects of Cr(VI) [6]. It is also important to investigate whether the antioxidant effect of ETS is sufficient to prevent Cr(VI)-induced hepatotoxicity.

Therefore, the aim of our work was to investigate the features of ETS effect on the enzymatic activity of ALP in the blood of rats under the toxic effect of Cr(VI).

White male *Wistar* laboratory rats were divided into 7 groups with 5 animals each group. The rats in the group I (intact control) were injected daily intraperitoneally (ip) with 150 µl of physiological saline for 14 days. Rats of group II were injected daily intragastrally (ig) with 1000 µl of oil for 14 days and then daily ip injected with physiological saline for 14 days. Animals of group III / IV received $K_2Cr_2O_7$ ip at a dose 2,5 mg Cr(VI)/kg body weight (bw) per day for 7days / 14 days. Rats of groups V were injected daily ig with an oil solution of ETS at a dose of 100 mg ETS/kg bw for 14 days and then daily ip injected with physiological saline for 14 days. Animals of groups VI and VII were administrated daily ig with an oil solution of ETS at a dose of 100 mg ETS/kg bw for 14 days and then daily ip injected with with $K_2Cr_2O_7$ at a dose 2,5 mg Cr(VI)/kg bw for 7 days (group VI) of 14 days (group VII). We determined the enzymatic activity of ALP in

blood plasma of rats. All calculations were performed mathematically and statistically (one-way ANOVA) using Microsoft Excel software.

Cr(VI)-induced oxidative stress was accompanied by a significant increase in the enzymatic activity of ALP in the blood plasma of animals of groups III and IV by 41 and 39%, respectively, compared with the control. Cr(VI) toxicity can cause membrane disintegration of ALP in hepatocytes with subsequent transfer of the corresponding enzyme to the blood plasma [4; 7]. The preliminary effect of ETS with subsequent Cr(VI) intoxication for 7 and 14 days contributed to a significant activation of ALP in rat plasma by 20 and 46%, respectively, compared with group II. However, the level of ALP activity of group VI (20%) compared to the group II was by 21% lower than the level of ALP activity in group III (41%) compared to the group I. The ALP activation in the blood of animals of group VII compared to group II remained at the level of the indicators of ALP activity in the blood plasma of rats of group IV relative to group I.

The results of the research show that the Cr(VI) toxicity causes the elevation of ALP activity in blood plasma of rats, which may indicate a hepatotoxic effect. The previous impact of ETS partially offset the negative effect of 7 days Cr(VI) toxicity by twofold lowering of blood plasma ALP activity. However, the antioxidant effect of ETS in the studied dose was insufficient to normalize ALP activity during the 14-day period of Cr(VI) toxicity.

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IN VITRO ANTIBACTERIAL ACTIVITY OF COMMERCIAL NATURAL ESSENTIAL OIL OBTAINED FROM STAR ANISE SEED (*ILLICIUM VERUM* HOOK.F.) AGAINST *ENTEROCOCCUS FAECALIS* STRAINS

Halina Tkaczenko, D.Sc., Professor, Institute of Biology and Earth Sciences, Pomeranian University in Słupsk, Słupsk, Poland;
ORCID: https://orcid.org/0000-0003-3951-9005
Maryna Opryshko, Researcher, M.M. Gryshko National Botanic Garden, National Academy of Science of Ukraine, Kyiv, Ukraine;
ORCID: https://orcid.org/0000-0001-5048-4961