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Czech Journal of Animal Science

Impact of cadmium on the level of hepatic metallothioneins, essential elements, and selected enzymes in the experimental rat model

Zídková J., Melčová M., Bartošová K., Šestáková I., Zídek V., Száková J., Miholová D.,

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The response of different strains of laboratory rats (*Rattus norvegicus* L.) on both acute (*via* intraperitoneal injection) and chronic (*via* drinking water and/or diet) cadmium intoxication was

investigated in the model study. The rat strains Long Evans (LE), Spontaneously hypertensive rat (SHR), and Brown Norway (BN) were tested and compared, and total Cd levels and metallothionein (MT) concentrations were determined in the liver of experimental animals. The liver MT concentrations were determined by using adsorptive cathodic stripping voltammetry and modified Brdička reaction and were significantly correlated ($r = 0.965$) with the total liver Cd content. Moreover, the Cd application resulted in increasing zinc liver contents confirming intensive MT synthesis in the rat liver. In the blood plasma, specific enzymatic activity of glutathione reductase (GR) and glutathione-S-transferase (GST) was determined suggesting increasing activity of GR with the amount of applied Cd for all three strains, whereas ambiguous results have been found for the activity of GST. Therefore, MT concentrations seemed to be more sensitive indicators of the Cd intoxication compared to the assessment of the specific enzymatic activity.

metal intoxication; liver; blood plasma;
detoxification; *Rattus norvegicus* L.

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