DEVELOPMENT OF A FISH MODEL FOR NEUROTOXICOLOGICAL STUDIES INVOLVING MANCOZEB

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Agrochemicals are indispensable to modern agriculture and are used to counteract pests that compromise agricultural production. The indiscriminate use of these compounds has led to environmental contamination and public health problems. Mancozeb (MZ; Manganese-zinc ethylenebisdithiocarbamate), a broad-spectrum and largely used fungicide is known for inducing carcinogenic, neurotoxic and embryotoxic effects, however the biochemical mechanisms involved in its toxicity are not completely understood. Here, we sought to develop an experimental model for studies on MZ induced neurotoxicity. Juvenile *Cyprinus carpio* were exposed to MZ concentrations in water under controlled conditions. The procedures were previously approved by CEUA-Unipampa (Protocol 43/2012). The experimental groups were: control, MZ 1mg/L, MZ 5mg/L and MZ 10mg/L, exposed for 7 days. The highest concentration corresponds to 10% of the LC₅₀ in fish. After exposure, fish were anesthetized and euthanized by cervical rupture. The brain was removed prepared for subsequent determination of biochemical parameters (enzyme activity of AChE, CAT and GST, cell viability assay and reactive oxygen species (ROS) production. In parallel, manganese (Mn) bioaccumulation analysis was performed in blood and brain tissues. Statistical analysis was done by one-way ANOVA followed by Dunnett's post hoc test. MZ exposure caused significant (p <0.05) increases in CAT (58.4±14.71%) activity at concentration of 1 mg/L. GST was increased (70.1±30.74% and 45.2 ± 23.25%) at concentrations of 1 mg/L and 5 mg/L, respectively (p <0.05). ROS levels were significantly (p <0.05) increased at MZ 10mg/L. A concentration dependent increase on Mn levels in both blood and brain was also observed. Our results indicate *Cyprinus carpio* as a valuable model for studies involving oxidative stress and neurotoxicity induced by MZ.

Key words: *Cyprinus carpio*; Mancozeb; oxidative stress.

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