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CONSEQUENCES OF LONG TERM EXPOSURE TO MICROPLASTICS AND EFFECTS ON CYTOGENETIC AND ANTIOXIDANT BIOMARKERS IN FISH

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Microplastic (MP) pollution in aquatic ecosystems has become a serious environmental problem. However, the issue is slowly being recognized because the European Commission claims a 74% reduction in plastic pellet pollution by the end of the decade [1]. Polystyrene (PS) makes up only 5.2% of global plastic production [2] but it is not biodegradable due to its structural stability. This implies that it will continue to persist in aquatic environments for a long time even if the amount of mismanaged waste decreases in the future. To effectively manage and mitigate the consequences of anthropogenic pollution in aquatic ecosystems, the toxic potential of MP needs to be appropriately studied. The aim of this work is to evaluate changes in cytogenetic and antioxidant biomarkers after PS exposure in rainbow trout (*Oncorhynchus mykiss*). Fish were subjected to a diet containing PS for 3.7 months. Cytogenetic analysis was carried out using erythrocytic nuclear abnormalities assay [3]. The formation of micronuclei, nuclear buds, nuclear buds on filament, blebbed nuclei cells were assessed as genotoxicity endpoints, as well as 8-shaped, fragmented-apoptotic and bi-nucleated cells as cytotoxicity endpoints. In order to analyze changes in antioxidant system, catalase (CAT) activity in liver homogenate was evaluated. Samples were incubated with H2O2 and the absorbance of the ammonium molybdate-H2O2 complexes was measured [4]. Data analysis was performed using R software [5]. The frequency of all observed nuclear abnormalities did not differ significantly when compared to the control. Meanwhile, CAT acitivity decreased significantly compared to the control group. In conclusion, we observed that PS exposure had a significant impact on fish antioxidant capacity. Understanding the effects of MP exposure is crucial for assessing the potential risks associated with plastic pollution. Study was funded by the Research Council of Lithuania through the project S-MIP-22-51 (ARFA).

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