

MEETING ABSTRACTS

EFFECT OF POLYSTYRENE MICROPARTICLES ON EMBRYONIC LIFE STAGES OF ZEBRAFISH (*DANIO RERIO*)

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Plastic pollution is a global problem caused by an excessive use of this material, its high resistance in the environment and poor waste management. In the environment, larger-sized plastic particles may be transformed into smaller particles, so-called microplastics (< 5 mm), which have been discovered in the bodies of various organisms, across all trophic levels of the aquatic environment (Provencher et al., 2017). Effects of microplastics on fish embryos are described as malformations, changes in behavior and swimming ability, early hatching, increased mortality and decreased heart rate (Bhagat et al., 2020). However, these negative effects must be interpreted based on environmental concentrations in water sources (0.0001 – 2 mg/L; Rodrigues et al., 2022), which leads to uncertainties when carrying out ecological risk assessment on these particles.

In our experiment, the effect of polystyrene microspheres (50 µm) on zebrafish embryos was tested in three concentrations – 0.001, 0.005 and 0.01% of solution for 96 hours with 18 eggs of zebrafish (*Danio rerio*) per each concentration. The plates were kept in a temperature-controlled test environment (26 °C) with a photoperiod of 12 h light/12 h dark. Testing solutions were replaced every day to make sure that the test concentrations remained their nominal values. During the test, each plate was checked for coagulation of fertilized eggs, lack of somite formation, lack of detachment of tail-bud from the yolk sack, lack of the heartbeat, hatching rate and developmental malformations. After 96 h exposure, 8 replicates were crated from each test group, with each sample containing 10 mg of embryos to subsequent PCR analysis of selected genes and proteomic to the systematic identification and quantification of selected proteins. The significant changes at tested concentrations were compared to control group, without microplastic addition. This research was supported by project IGA VETUNI 213/2022/FVHE and PROFISH [no. CZ.02.1.01/0.0/0.0/16-019/0000869]

Keywords: microplastics; toxicity; embryo; fish; pollution

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