
IDENTIFYING AN OXIDATIVE STRESS RESPONSE IN ZEBRAFISH (*Danio rerio*) FED WITH MICROPLASTICS

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Abstract

The use of plastics and its potential toxic effects is an emerging problem today. Thus, we aimed to test the hypothesis that pairing commercial fish flakes with a 10% microplastic diet could be linked to an increased amount of oxidative stress in zebrafish (*Danio rerio*). This induction of stress response is an indicator for chemicals stressors in cells. Four different treatments were prepared to feed the animals daily at scheduled time. Those were divided into 12 distinct tanks, with each 36 animals. The first treatment was with fish flake (A); the second with virgin pellet (B); the third with collected microplastics from Lambra's beach in Lanzarote (C) and the fourth contained microplastic from Porís' beach in Tenerife (D). Three replicates of each diet were prepared. At T0, T7, T30 and at T60 the animals were euthanised and frozen. For the biomarker analysis, a homogenized sample was prepared. Catalase (CAT) and Glutathione-*S*-transferase (GST) were measured as biomarkers, lipid peroxidation (LPO) and electron transport system (ETS) were measured as oxidative damage indicators. GST seems to generally increase in all treatments. For CAT, no significant difference was found, even though treatment A and B constantly increase, and treatment C and D show a peak at T30 and then flatten at T60. LPO shows no significant difference. For ETS, even though there is no significant difference the control shows the highest level at T60.

To conclude, the enzymatic response varies according to the different enzymes. After 30 days it can be assumed that the production of ROS in treatments C and D has oversaturated the antioxidant defences (related to CAT) provoking an inhibition of the functioning of the antioxidant defences. This is translated by lower CAT levels at T60 in treatments C and D and higher ones in treatments A and B.

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