CHRONIC EXPOSURE TO THE HERBICIDE PARAQUAT PROMOTES IMBALANCE IN THE ANTIOXIDANT SYSTEM AND BEHAVIORAL CHANGES IN ZEBRAFISH (Danio rerio)

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The chronic exposition to the herbicide Paraquat (PQ) can induce behavioral changes that mimic the parkinsonism signs. The aim of this study was to investigate the association between the pro-oxidative effects of chronic exposure to the PQ with the behavioral changes in the teleostean fish zebrafish. Adult zebrafishes were chronically treated with PQ (20 mg/kg) by intravenous duct for a period of 16 days. The control group was submitted to the same conditions being treated with saline solution (0.9 %). It were evaluated behavioral parameters using the following tests: aggression, risk assessment, locomotion, freezing and preference times zone. Using biochemical assays, it were determined classic biomarkers as catalase (CAT), superoxide dismutase (SOD), lipid peroxidation (TBARS), and glutathione S-transferase (GST) in brain tissue. The results of the behavioral tests indicated that the animals treated with PQ were more aggressive and remained less time in areas considered safe in behavior aquariums, as well as presented decrease in risk assessment. Only the biomarkers CAT and GST showed changes in treated animals: decreased activity for CAT and increased for GST. The TBARS levels and SOD activities did not showed statistical difference between groups. These results indicated an imbalance in the redox system, despite not having been found oxidative damage. The behaviors changes in animals treated with PQ can be associated with the depletion in the CAT activity, generating an increase of hydrogen peroxide, that beyond to cause oxidative damages still can act as neurochemical flags influencing the animals behaviors.

Keywords: zebrafish, Paraquat, behavior

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