Effects of Exposure to Dichlorophenoxyacetic Acid (2,4-D) in Embryonic Development and Energy Metabolism *Zebra Fish*

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Introduction: Although the use of herbicides is for the benefit of agricultural crops they have a high chance of contaminating aquatic environments causing negative impacts. Some of the toxic effects of these products are described to interfere in energetic metabolism and in the process of cell division. The 2,4-D is an organochloride, classified as Class I (highest degree of pesticide toxicity group). Objective: To evaluate the effects of 2,4 dichlorophenoxyacetic and Tordon in morphology, as well as on energy metabolism during zebrafish embryogenesis. Material and methods: The tests used the commercial compound (Tordon) and the 2,4-D pure.The toxicological evaluation was conducted through toxicity test on fish embryo (FET) using different concentrations of compounds. Biochemical parameters such as glucose and glycogen dosage and the activity of hexokinase, pyruvate kinase, glucose 6-phosphate dehydrogenase, phosphoenolpyruvate carboxykinase and glucose-6-phosphatase, as well as amino acids metabolism determination using aspartate aminotransferase, glutamate dehydrogenase and alanine aminotransferase activities were measured using embryos exposed to different concentrations of herbicides and the assays followed the literature. Results and Discussion: In sublethal concentrations of Tordon® (5 and 10 mg / L) embryos showed cardiac edema, clot in the skull and heart, delayed development and hatch. There was a significant decrease in total protein and alterations in metabolites parameters and enzymes activities of embryos exposed to Tordon®. Conclusion: The tests showed that the Tordon commercial compound is capable of causing morphological and biochemical changes in Zebra fish embryos.

Key words: 2,4-D, Zebra fish, embryo, toxicology, metabolism.
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