OFFICIAL ABSTRACT and CERTIFICATION

Modified acetylcholinesterase activity and protein modulation as a result of chlorpyrifos exposure in D. tigrina: Preliminary Results

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Chlorpyrifos (CPS) is an organophosphate that since its registration in 1965, has both agricultural and nonagricultural uses, being sprayed on crops, animals, golf courses, and buildings to kill insects. Six million pounds of CPS was used across 10 million acres of land, making it the most commonly used insecticide in the United States, and it can contaminate the air, water, and soil. This study aims to first determine if various doses of the pesticide chlorpyrifos (CPS) are toxic to planaria through LC50 assays. This study will also examine if CPS has a similar inhibitory effect on AChE in planaria as it does in other organisms by quantifying acetylcholinesterase activity levels using a colorimetric assay kit and if planaria exposed to CPS will have altered AChE protein levels by running a quantitative ELISA. We have identified that CPS exposure is toxic to planaria when acutely exposed to concentrations between .1 mg/ml and .5 mg/ml for 20 minutes and between .05 mg/ml and .1 mg/ml when chronically exposed for 72 hours. We expect that worms exposed to various concentrations of CPS will have decreased AChE activity levels, more notably at higher concentrations. In addition, exposed planaria will increase their acetylcholinesterase protein levels in order to counteract lowered activity due to AChE inhibition.

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