

## TOXICITY OF THE SUGARCANE HERBICIDES AMETRYN AND TEBUTHIURON TO TILAPIA (*Oreochromis niloticus*) FINGERLINGS

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Herbicides are the most common pesticide used in agriculture, but the impact of this practice on non-target organisms isn't well known. In the environment these compounds are rarely alone, but almost no information is available about the combined toxicity of herbicides. The aim of this work was to evaluate the effects of the mixture of ametryn and tebuthiuron, two herbicides widely used in sugarcane cultivation, the predominant crop of the state of São Paulo, Brazil. The acute toxicity of the mixture was evaluated to tilapia (*Oreochromis niloticus*), the main specie cultivated and caught in this region. Herbicides were used in the form of commercial products in two formulations: ametryn (concentrated suspension containing 50% active ingredient) and tebuthiuron (concentrated suspension containing 50% ai). Five concentrations of the mixture of ametryn and tebuthiuron were tested [0 (control), 3, 5, 9, 16 and 30 mg L<sup>-1</sup>] in duplicate. Fish (Ls = 4.72 ± 0.81 cm Wt = 3.67 ± 1.61 g) (n = 60) were stocked in 10L aquarium with forced aeration, maintaining a density approximately 2 g of fish L<sup>-1</sup>. The experimental units were kept in a room with controlled photoperiod (16:8 h light: dark) and temperature (26 ± 2 ° C). The endpoints monitored included abnormal behavior (as erratic swimming, loss of equilibrium and paralysis) and death. Statistical analysis was performed with Stratgraphics 5.1. The Additive Index and ToxCalc spreadsheet built over Microsoft Excel were used to determine the model that best describes the mixture. Ametryn is most toxic than tebuthiuron, presenting a LC<sub>50-96h</sub> of 4.41 (3.63 - 5.26) mg L<sup>-1</sup> and 223.04 (199 - 250) mg L<sup>-1</sup>, respectively. When fish were exposed to the mixture of these two herbicides, a LC<sub>50-96h</sub> was determined in 10.76 (8.54 - 14.28) mg L<sup>-1</sup>, showing independent action. As a deviation from the model we observed that there is lightly antagonism between the components of the mixture (Additive Index = -0,541). Fish exposed to concentration of 9 mg L<sup>-1</sup> exhibited lost of equilibrium, paralysis, abdominal enlargement and remained constantly at the top of tanks. The endpoints evaluated on this work were useful to understand the mode of action of the binary mixture and reinforce the importance of monitoring sublethal parameters to assess the real risk of agrochemicals found on aquatic ecosystems.

Keywords: mixture, acute toxicity, agrochemical