REPRODUCTIVE IMPACTS OF THE HERBICIDE IMAZETAPIR IN A NON-TARGET MODEL *Caenorhabditis elegans*

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INTRODUCTION: Imazethapyr is a herbicide with high environmental persistence, used in several crops, such as rice. In previous studies, imazethapyr has been detected in natural water samples from the Uruguai River/RS, but its toxic effects have not yet been sufficiently explored in non-target organisms, such as *Caenorhabditis elegans*, a free-living nematode with a short life cycle and high homology to human genes.
MATERIALS AND METHODS: For the present study, the strains used were N2 (wild type) and MD701 *([lim-7p*::*ced-1*::GFP + *lin-15*(+)]), a strain that marks the formation of apoptotic cells in the worm's gonads. The worms were kept at 20ºC on plates containing growth medium for nematodes with *Escherichia coli* OP50 as a food source. After synchronization, when they reached the L1 larval stage, they were exposed to Imazetapir at concentrations of 0 (control), 1, 5, 10, 50 and 100 µg/mL for 30 minutes and subsequently washed. After 48 hours, clutch size, egg production, egg viability and the number of apoptotic cells were evaluated. Statistical analysis was performed in GraphPad Prism 8 software, using one-way ANOVA with Tukey's post-hoc and Shapiro-Wilk normality test.
RESULTS AND CONCLUSION: The results showed a decrease in clutch size from the concentration of 5 µg/mL, in addition to a decrease in egg production in the gonad from the lowest concentration of 1 µg/mL, indicating that not only the number of offspring was affected, but also the number of eggs produced. After this, we evaluated the viability of the eggs, making a relationship between the hatched worms and the infertile eggs, demonstrating that at a concentration of 100 µg/mL there is a significant percentage of infertile eggs. Finally, the MD701 strain demonstrated a significant increase in the formation of cells undergoing apoptosis in the gonads, corroborating with the other reproductive parameters affected in the worm. Exposure to the herbicide imazethapyr significantly affected reproductive parameters in *C. elegans* in different ways, indicating that the toxicity of the herbicide may be interfering with gamete formation.

Keywords: Environmental Toxicology; Pesticides; Alternative Model; Environmental Pollution; Reproductive System.