EVALUATION OF THE TOXIC EFFECTS OF THE HERBICIDE IMAZETHAPYR ON *Caenorhabditis elegans*: ANALYSIS OF DEVELOPMENT AND NEURONAL VIABILITY

Jullia Dalbianco Godoy de Oliveira[1]; Eugênia Carla Kuhn[1]; Daiana Silva de Ávila[1]

[1] Universidade Federal do Pampa (UNIPAMPA) - *campus* Uruguaiana/ Rio Grande do Sul

INTRODUCTION: The constant use of pesticides has led to a scenario of environmental contamination, affecting various biomes, such as the Pampa. The city of Uruguaiana/RS is known for its rice production, thanks to its flat lands and irrigation from the Uruguay River. In previous studies, the herbicide Imazethapyr was identified in samples from the Uruguay River. Its toxicity is well known in target organisms but not fully understood in non-target organisms such as *Caenorhabditis elegans*, a free-living nematode with a short life cycle and high homology with human genes. **OBJECTIVE:** To evaluate the effects of Imazethapyr on the in vivo non-target model *Caenorhabditis elegans*. **METHODOLOGY:** For this study, the strains used were N2 (wild type), LX929 (vsIs48 [*unc*-17::GFP]), and BY200 (vtIs1(*dat*-1p::GFP; rol-6)). The worms were maintained at 20°C on nematode growth medium plates with *Escherichia coli* OP50 as a food source. After synchronization, when they reached the L1 larval stage, they were exposed to Imazethapyr at concentrations of 0 (control), 1, 5, 10, 50, and 100 µg/mL for 30 minutes and then washed. After 48 hours, survival, body length, swimming behavior, dopamine-induced paralysis assay (SWIP), and fluorescent strain evaluation were assessed. Statistical analysis was performed using GraphPad Prism 8 software, employing one-way ANOVA with Tukey's post-hoc test and the Shapiro-Wilk normality test. **RESULTS:** The results showed a decrease in survival from the 10 µg/mL concentration, along with a reduction in body size, indicating developmental delay. Worm movement coordination is mediated by cholinergic and GABAergic neurons; therefore, we evaluated swimming behavior in a liquid medium. Worms exposed to concentrations of 5 µg/mL and higher showed reduced speed and distance traveled. The LX929 strain (tagging cholinergic neurons) exhibited a decrease in fluorescence at 100 µg/mL, correlating with reduced movement. In the SWIP assay, animals exposed to 50 and 100 µg/mL took longer to paralyze. Regarding dopamine neurons, we observed a reduction in fluorescence at the same concentrations, indicating neuronal function impairment. **CONCLUSION:** Herbicide exposure negatively affected various parameters in the worms, indicating an important toxicity to a non-target model.

Palavras-chave: ecotoxicology; pollutants; pesticide; fluorescent strains; alternative model