DROSOPHILA MELANOGASTER AS AN ALTERNATIVE MODEL FOR TOXICOLOGICAL STUDIES OF THE EFFECTS OF THE PESTICIDES BROMACIL AND TERBACIL ON ENERGETIC METABOLISM

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Introduction – Metabolic-dysfunction-associated fatty liver diseases (MAFLDs) are highly prevalent worldwide and no effective treatment is available. The diseases present different etiologies and the effects of the pesticides should be considered. Among these chemical the uracil-based pesticides, such as bromacil and terbacil, present considering stability in the environment which may contribute to the development of deleterious metabolic changes. In this context, *Drosophila melanogaster* is a promising alternative model to be used for metabolic dysfunctions analyses because it's conserved metabolic pathways with mammals. **Objective** –This study aims to evaluate the effect of the pesticides bromacil and terbacil in the energetic metabolism of *D. melanogaster*, as an alternative approach to understand the fine-tuning of the mechanisms that may conduct to fatty liver. **Methodology** – Virgin males from Canton-S strain were exposed for 15 days to diets containing bromacil (5 nM, 50 nM, 5 µM, 50 µM) or terbacil (5 nM, 500 nM, 5 µM). At the end of the exposure, groups of 10 males were homogenized in phosphate buffer for biochemical quantification of TG and GL using colorimetric methods. **Results and Discussion** – bromacil exposure led to a significant reduction in TG levels at 5 nM (-62.6%), 50 nM (-79.5%), and 50 µM (-76.3%); otherwise at 5 µM TG levels increased (+42.6%). For glucose, bromacil caused reductions in this metabolite at 5 nM (-59.2%), 5 nM (-78.2%) and 50 µM (-70.7%), with a slightly increase at 5 µM (+3.8%). In contrast, terbacil promoted increased TG levels at all evaluated concentrations: 5nM (+72.3%), 500 nM (+12.7%), and 5 µM (+70.5%). Glucose levels also increased at 5 nM (+41.0%) and 500 nM (+22.9%), but decreased at 5 µM (-5.6%). These results indicate dose-dependent and compound-specific effects, suggesting metabolic disruption and the activation of metabolic routes to maintain animals alive. Ongoing studies include measurements of oxidative stress markers (GSH and ROS) and genomic DNA analysis, to explore molecular mechanisms underlying the observed metabolic changes. **Conclusion** – Bromacil and terbacil induce significant and divergent alterations in energy metabolism in *D. melanogaster*, highlighting their toxic potential and reinforcing the usefulness of this model for environmental toxicology and metabolic disease research.

Key words: alternative models; *Drosophila melanogaster*; energetic metabolism; pesticides; MAFLD.

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