IMPACT OF CYHALOFOP-BUTYL ON EARLY EMBRYO DEVELOPMENT IN MICE EXPOSED DURING GAMETOGENESIS

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INTRODUCTION: Cyhalofop-butyl (Cia-b) is a post-emergence herbicide extensively applied in rice cultivation, yet its reproductive toxicity in mammals remains poorly characterized. **OBJECTIVE:** This study aimed to investigate the potential embryotoxic effects of Cia-b exposure during female gametogenesis in a murine model. **MATERIAL AND METHODS:** Sixty female B6D2F1 mice were randomly distributed into four groups (n = 15 per group): one control group (Naive) and three treatment groups that received daily oral administration of Cyhalofop-butyl (Cia-b) at concentrations of 0.1 mg/L, 1.0 mg/L, or 10.0 mg/L over a period of 19 consecutive days. Following hormonal induction of superovulation and mating, embryos at the two-cell stage were harvested on the second day post-coitum and cultured in vitro through Day 5. The rate of blastocyst development was determined for each experimental group. A global chi-square test was conducted to assess overall differences among the groups, and pairwise comparisons were subsequently performed using three statistical correction methods for multiple testing: Bonferroni, Holm-Bonferroni, and the Benjamini-Hochberg False Discovery Rate (FDR). The experimental protocol received approval from the Animal Research Ethics Committee at Univali (Protocol No. 009/2024). **RESULTS:** The blastocyst formation rates were 100.0% (control), 94.9% (0.1 mg/L), 96.4% (1.0 mg/L), and 94.1% (10.0 mg/L). The global chi-square analysis showed no statistically significant difference among the groups ($p = 0.124$). Although pairwise comparisons revealed a trend toward reduced blastocyst development in the 0.1 mg/L and 10.0 mg/L groups compared to controls ($p = 0.070$ and $p = 0.038$, respectively), these findings did not remain

statistically significant after correction for multiple testing. The lowest adjusted p-value was observed with the Benjamini-Hochberg method (adjusted p = 0.210). **CONCLUSION:** Oral exposure to Cyhalofop-butyl during gametogenesis did not significantly impair early embryonic development in mice under the tested conditions. While mild reductions in blastocyst formation were observed at certain doses, the effects were not statistically robust. Further studies are warranted to explore potential molecular and subclinical effects, particularly those related to oxidative stress, apoptosis, and immune modulation.

Keywords: Agrochemicals. Reproduction. Toxicity.