



Aqueous ozonation of herbicide, thiobencarb: Implications for oxidative stress on mosquito fish *Gambusia affinis*.

¹Abdel-Halim K. Y., ²Abd elrazik, M.A.A and ³Abdou, G. Y.

¹Mammalian & Aquatic Toxicology Department, Central Agricultural Pesticides Laboratory, Ministry of Agriculture, Dokki, 12611, Giza, Egypt

²Pesticide department, Faculty of agriculture, Elmenoufia Univeristy, Egypt

³Pests and Plant Protection Department, National Research Centre, Giza, Egypt

Abstract: The role of aqueous ozonation among stimulation of the potential toxic effects of herbicide; thiobencarb on mosquito fish *Gambusia affinis* was examined after 96 hrs exposure. Two levels (1/5 and 1/10LC₅₀) of herbicide were used individuals or mixed with either 1 or 5 ppm of ozone (O₃). The aqueous ozonation of thiobencarb stimulated acetylcholinestrace (AChE) activity to reach the highest value (0.186 $\mu\text{mole}\cdot\text{mg}^{-1}\cdot\text{min}^{-1}$) in case of [1/5LC₅₀ thiobencarb+O₃ (5 ppm)] treatment. All treatments induced increase of malondialdehyde (MDA) levels compared with untreated group which not exceeded than 1.52 mM.g⁻¹ tissue. Catalase (CAT) and glutathione peroxidase (GP_x) showed variability in their response to ozonation process, especially GP_x which subjected to values lowest than those of untreated group. On the other hand, lactic dehydrogenase (LDH) activity increased in most treatments, where 1/10LC₅₀ thiobencarb recorded the highest value (512.7 U. L⁻¹). The lowest one was recorded for [1/10LC₅₀ thiobencarb+O₃ (1 ppm)] treatment to be 129.5 U. L⁻¹. This fact represents the cytotoxic effect of examined herbicide under ozonation condition. The all data revealed that, ozonation process for pesticide removal must be done under especial conditions and usage of catalytic agents to decline their potential toxic effects on organisms.

Key words: thiobencarb; aqueous ozonation; mosquito fish; oxidative stress; cholinesterase.

***** *****