THE PROTECTIVE ROLE OF OXIME K026 AGAINST CHLORPYRIFOS POISONING IN DROSOPHILA MELANOGASTER MODEL

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The increase of agricultural practices has led to indiscriminate use of agrochemicals, causing damage both to the environment and to human health. Chlorpyrifos (CP) is an organophosphate agrochemical widely used due to its low persistence in the environment. The damage caused by Chlorpyrifos leads to neurotoxicity induced by inhibiting the enzyme acetylcholinesterase (AChE), which causes an increase in the acetylcholine neurotransmitter, promote a high excitation in central nerves system, muscle junctions, causing disturbance of normal physiological functioning. Furthermore, chlorpyrifos induces oxidative stress by reactive oxygen species formation. The treatment of CP poisoning based mainly on the use of a symptomatic antidote, as atropine, and oximes (pralidoxime) with less frequency. Oximes are reactivating the acetylcholinesterase activity, reacting directly with the phosphorylated enzyme, restoring the active center conditions, to remove the phosphoryl group attached to the ester group of the protein. The aim of this study was to investigate the potential of AChE reactivator of oxime K026 front the poisoning of organophosphate Chlorpyrifos. To perform this study, we used Drosophila melanogaster female adults with age between 1-4 days. They were treated in presence/absence of chlorpyrifos at the 0.75 ppm concentration for 24 hours and also treated with K026 oxime at the 1.15ppm concentration diluted in 1% sucrose, and the control group were treated only with 1% sucrose. After the treatment, the mortality, locomotor deficit of surviving flies, and the enzyme acetylcholinesterase activity was measured. Chlorpyrifos has caused mortality and significant locomotor deficit in flies treated when compared to control group (p <0.05), which was reversed when co-treated with the oxime K026. The activity of AChE was significantly decreased with chlorpyrifos exposure and when co-treated with the oxime K026, the enzyme activity was reversed at the control level. These data point to the oxime K026 as an interesting way for treatment of organophosphates poisoning.

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