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## **THE INFLUENCE OF DIAZINON AND ITS METABOLITES ON ACETYLCHOLINESTERASE, $\text{Na}^+/\text{K}^+$ -ATPASE AND ANTIOXIDANT ENZYMES IN RAT BRAIN SYNAPTOSOMES**

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The aim of this study was to investigate neurotoxic potential and oxidative stress responses of diazinon and its metabolites, diazoxon and 2-isopropyl-6-methyl-4-pyrimidinol using synaptosomes as a model system. Synaptosomes were isolated from the brain of Wistar albino rats and incubated at 37°C for 1 hour in the presence of selected concentrations of the investigated compounds. Acetylcholinesterase,  $\text{Na}^+/\text{K}^+$ -ATPase and antioxidant enzymes activities were determined by standard spectrophotometric methods. Diazinon induced concentration-dependent acetylcholinesterase and  $\text{Na}^+/\text{K}^+$ -ATPase inhibition, while the activity of catalase, superoxide dismutase and glutathione peroxidase was not significantly affected. Increasing concentrations of diazoxon, oxo analog of diazinon, caused almost complete acetylcholinesterase and  $\text{Na}^+/\text{K}^+$ -ATPase inhibition, and activated antioxidant enzymes: catalase (up to 25%), superoxide dismutase (up to 55%) and glutathione peroxidase (up to 30%). Unlike diazoxon, diazinon hydrolysis product, 2-isopropyl-6-methyl-4-pyrimidinol did not remarkably change the activities of the investigated enzymes, except superoxide dismutase that was stimulated up to 25%. The obtained results suggest that neurotoxic and prooxidative potential of diazinon, thioorganophosphate used as a commercial insecticide preparation, significantly reinforces mostly due to its transformation to diazoxon in the metabolic pathways.