

Cytotoxicity thiamethoxam Study on the Hepatopancreas and Its Reversibility under the Effect of Ginger in *Helix aspersa*

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Abstract : Living organisms in the soil are subject to regular fluctuations of abiotic parameters, as well as a chemical contamination of the environment due to human activities. They are subject to multiple stressors they face. The aim of our work was to study the effects of insecticide: thiamethoxam (neonicotinoid), and the potential reversibility of the effects by an antioxidant: ginger on a bioindicator species in ecotoxicology, the land snail *Helix aspersa*. The effects were studied by a targeted cell approach of evaluating the effect of these molecules on tissue and cellular aspect of hepatopancreas through histological study. Treatment with thiamethoxam concentrations 10, 20, and 40 mg/l shows signs of inflammation even at low concentrations and from the 5th day of treatment. Histological examination of the hepatopancreas of snails treated with thiamethoxam showed significant changes from the lowest concentrations tested, note intertubular connective tissue enlargement, necrosis deferent types of cells (cells with calcium, digestive, excretory), also damage acini, alteration of the apical membrane and lysis of the basement membrane in a dose- dependent manner. After 10 days of treatment and with 40 mg/l, the same changes were observed with a very advanced degeneration of the wall of the member that could be confused with the cell debris. For cons, the histological study of the hepatopancreas in *Helix aspersa* treated with ginger for a period of 15 days after stopping treatment with thiamethoxam has shown a partial regeneration of hepatopancreatic tissue snails treated with all concentrations of thiamethoxam and especially in the intertubular connective tissue of the wall and hepatopancreatic digestive tubules. Finally, we can conclude that monitoring the effect of the insecticide thiamethoxam showed significant alterations, however, treatment with ginger shows regeneration of damaged cells themselves much sharper at low concentration (10 mg/L).

Keywords : *Helix aspersa*, insecticides, thiamethoxam, ginger, hepatopancreas

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