

ABSTRACT

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Title of diploma thesis: Effect of the subchronic and early-life permethrin exposures on rat liver: oxidative stress and endogenous antioxidant responses

Permethrin is a widely used insecticide with a low acute toxicity to mammals; however, there are concerns about consequences of a long term and an early life exposure to this compound. Two different animal models were chosen in order to study effects of permethrin on liver. In the *model of subchronic treatment*, adolescent rats treated for 60 days with permethrin (150 mg/kg body weight/day) were used and sacrificed immediately after the treatment. As far as the *model of early life* is concerned, the treatment with permethrin (34.05 mg/kg body weight/day) lasted for 15 consecutive days in early life and sacrifice took place after the interval of 300 days since the beginning of the treatment.

To evaluate the impact of permethrin treatment on liver tissue, markers of oxidative stress (lipid peroxidation, content of carbonyl groups), amount of superoxide dismutase, catalase, glutathione peroxidase, activity of glutathione transferase, amount of glutathione and fluidity of membranes were measured.

This work demonstrated that permethrin treatment caused an oxidative stress and alterations in antioxidant enzymes within both models. The changes were more pronounced in the *model of subchronic treatment* as the liver in the *model of early life treatment* showed a high ability to renew a damaged tissue before the sacrifice was made. An increased oxidative stress is one of the factors leading to several serious diseases, thus an exposition to permethrin might be associated with an outbreak of these diseases. Further studies to evaluate effects of permethrin on molecular level, especially on gene expression, are necessary to be done.