ABSTRACT

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The resistance of parasitic helminths to anthelmintic drugs is a growing worldwide phenomenon and a concerning issue. Xenobiotic metabolizing enzymes play an important role in drug resistance development as they can lower the concentration of the anthelmintics in the parasite's body and therefore protect the parasite from the anthelmintic effect. The role of drug metabolizing enzymes in drug resistance development has been already described in the group of roundworms and flukes. Limited information is available about this topic in tapeworms. In our study we decided to test the possibility of the anthelmintic mebendazole to affect the activity of these enzymes and possibly to influence the drug resistance development in rat tapeworm (*Hymenolepis diminuta*).

Our first goal was the isolation of adult tapeworms from the definitive host (rat, *Rattus norvegicus*). We used mealworm beetle (*Tenebrio molitor*) as an intermediate host. After the successful isolation, adult tapeworms were incubated with the mebendazole (1 and 10μM) in RPMI-1640 medium (5 % CO_2, 37 °C) for 24 hours. Following the incubation cytosol-like, microsomes-like and mitochondria-like subcellular fractions were prepared and the activities of selected xenobiotic metabolizing enzymes were measured.

The results of our study indicate that the activity of certain xenobiotic metabolizing enzymes of rat tapeworm can be increased in reaction to mebendazole exposition. In the cytosol-like fraction we observed increased activity of catalase, peroxidase, superoxide dismutase, aldo-keto reductase 1A1, glutathione-S-transferase. In mitochondria-like fraction we observed increased activity of aldo-keto reductase 1C. Furthermore we observed decreased activity of glutathione reductase in cytosol-like fraction, aldo-keto reductase 1A1 and carbonyl reductase in mitochondria-like fraction.