

ABSTRACT

Charles University in Prague
Faculty of Pharmacy in Hradec Králové
Department of Biochemical Sciences

Candidate: Bc. Anna Crhová

Supervisor: RNDr. Lucie Stuchlíková Raisová, Ph.D.

Title of diploma thesis: Biotransformation of monepantel in plants (*Campanula rotundifolia*, *Plantago lanceolata*)

Anthelmintics are veterinary drugs used to eliminate disease caused by parasitic worms. Monepantel (MOP) is a representative of amino-acetonitrile derivatives. This relatively new group of drugs is effective on helminthic strains, which are resistant to classic therapy (benzimidazoles, makrocyklic lactones, imidazothiazoles). Due to high consumption of these drugs, it is important to find out their fate in the exposed organisms. Anthelmintics are in contact with the environment and they can affect terrestrial and aquatic organisms. Their various forms can be accumulate in plants. These plants can be eaten by the animal, which may lead to development of resistance in helminths. In addition, the physiology of plants and animals may be disrupt and, consequently, biodiversity loss may occur. The aim of this study was to determine the biotransformation processes occurring in ribwort plantain (*Plantago lanceolata*) and harebell (*Campanula rotundifolia*) after low concentrations of MOP. Suspensions of both plants cells were used as an *in vitro* model system. Ultrahigh-performance- liquid chromatography coupled with high mass accuracy tandem mass spectrometry (UHPLC-MS/MS) was used for identification of metabolites. A total of 11 MOP metabolites were found and they did not differ widely from one plant to another. The first phase of biotransformation dominated. Based on identified metabolites the schemes of metabolic pathways were proposed. From the obtained results it is possible to say that suspension of ribwort plantain and harebell cells can uptake and metabolize MOP.