Abstract

A synthetic hormone 17α-ethinylestradiol (EE2) which is a component of hormonal contraception pills has been identified as a main component of the endocrine-disrupting compounds (EDc). EDc are substances that mimic natural hormones in their action. Recently their amount especially in the groundwater and the surface water has been increased, which results in a negative impact on the hormonal system especially of aquatic organisms. Since it is not easy to replace these substances from the environment by conventional techniques other possibilities of their biodegradation are examined. White rot fungi, which are able to degrade lignin in nature, have promising biodegradation abilities towards many pollutants. These fungi contain a wide range of non-specific extracellular and intracellular enzymes that play an important role in the degradation.

This bachelor thesis was targeted on the study of a white rot fungus, *Pleurotus ostreatus*, and especially on the degradation potential of its intracellular enzymes in the biodegradation of EE2.

Initially, the ability of fungi *Pleurotus ostreatus* to degrade EE2 *in vivo* was tested. During the 48 hour incubation there was replaced 95,5 % of EE2. However, the role of cytochromes P450 (CYPs) in a metabolism of EE2 was not confirmed in this experiment by reason that an inhibitor of CYP 1-aminobenzotriazole (1-ABT) did not reduce the efficiency of degradation. Therefore in the next period of the bachelor thesis degradation experiments were carried out with a microsomal fraction (MF) isolated from the mycelium of this fungus. Two sets, a control set and an EE2 exposed one, were prepared for isolation of microsomes. The active form of CYP with maximum absorbance about 450 nm was detected in all preparations via the differential spectroscopy with CO. The first assumption that exposure of fungi *Pleurotus ostreatus* to EE2 should led to an induction of CYPs responsible for its degradation has not been confirmed neither providing of a specific CYPs content nor the degradation experiments. The results of these experiments indicate that the degradation of EE2 by microsomal fractions occurs, but independently of the type of microsomes used. In this case 1-ABT was successful to inhibit the 95 % of degradation which suggests that the CYPs are responsible for metabolism of EE2 in the microsomal fraction.

Keywords: 17α-ethinylestradiol, Biodegradation, *Pleurotus ostreatus*, Cytochrome P450, Microsomal fraction

(In Czech)