

The aim of this bachelor thesis was to determine the possibility of phytoextraction of benzodiazepine bromazepam as a widely used drug with anxiolytic effects. Benzodiazepines are compounds with high biological activity and together with their metabolites are excreted into urine. These substances then get into municipal wastewater treatment plant, whereas efficiency of removal in wastewater treatment plants is not high and compounds enter into surface water. Afterwards, the entire ecosystem including food chains is contaminated. A long-term exposure to trace concentrations can have a great effect on aquatic and terrestrial organisms.

Maize (*Zea mays*) was used to study the phytoextraction. The Murashige and Skoog medium was enriched by $10 \text{ mg} \cdot \text{L}^{-1}$ bromazepam and samples of medium were taken at 24 hour intervals. After that, samples were analysed in reverse phase at 233 nm by HPLC/UV. Time dependence of bromazepam concentrations in medium was evaluated, which showed decrease of ca. 40 % during 168 hours of cultivation. Ability of corn cultivar to extract bromazepam from aqueous solutions was clearly demonstrated. The amount of extracted bromazepam corresponds to 0.03 milligrams per 1 gram of plant fresh weight. Although the tested concentrations of the xenobiotic used are substantially higher than the actual environmental concentrations, experiments demonstrate a real possibility of a technological use. Except this result, the investigation shows the possibility of contamination of the food chain and this thesis is thus a contribution to food safety assessment.

Key words: phytoextraction, wastewater, pollution, benzodiazepine, bromazepam, HPLC