

# Abstract

This bachelor thesis is devoted to the phytoextraction of the anxiolytic buspirone from a cultivation medium and to the study of the effect of plant stress on the plant metabolism. Two experiments were carried out with maize (*Zea mays*) grown hydroponically in a sterile medium for 10 and 14 days. After the addition of a solution of medium containing buspirone at concentrations of 10 and 5 mg · L<sup>-1</sup>, samples of medium were collected at 1-day intervals from all experimental plants. The decreasing concentration of buspirone in the medium was monitored by reversed phase HPLC/UV at a wavelength of 240 nm.

In the first experiment with 10 mg · L<sup>-1</sup> as the initial concentration of buspirone in the medium, a 65 % decrease was observed over the 96 hours during which the phytoextraction was carried out. The overall decrease in buspirone concentration was 53 % in 144 hours of phytoextraction in the second experiment with an initial concentration of 5 mg · L<sup>-1</sup> in the medium.

After the completion of the phytoextraction experiments, the activities of total peroxidases, membrane-bound peroxidases, guaiacol peroxidase and ABTS-peroxidase were determined in the leaves and roots of the plants. Furthermore, the content of phenolic substances, which belong to the group of so-called secondary metabolites and their effects are related to the antioxidant system of plants, was determined. Peroxidase and shikimate dehydrogenase activities and isoforms were detected in gels after native electrophoretic separation. All measured values were compared with control plants grown without buspirone in the medium.

Key words: buspirone, phytoremediation, higher plants, phytoextraction, plant enzymes