



## DOES CESIUM AFFECT ENZYMATIC ACTIVITY IN *ATRICHUM UNDULATUM* IN *IN VITRO* CONDITIONS?

Hatással van a cézium az *Atrichum undulatum* lombosmoha enzimatiszus aktivitására *in vitro* körülmények között?

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Due to their unique morphological and physiological features, mosses are very useful indicators of various contaminants. After the Chernobyl accident, an interest in mosses as biomonitors of radioactivity increased, and they were used for mapping <sup>137</sup>Cs deposition in contaminated areas. Cesium is chemically similar to potassium, which is essential element for plants. Therefore, it could compete with K<sup>+</sup> causing a significant reduction in its transport, which can lead to the potential metabolic interference and poor growth. In addition, radionuclides could directly or indirectly cause the outbreak of reactive oxygen species (ROS). One of the common protective mechanisms to ROS is an increase in antioxidant enzyme activities. Therefore, the aim of this research was to investigate whether the nonradioactive <sup>133</sup>Cs affect the activity of antioxidative enzymes (catalases (CAT), peroxidases (POX), and superoxide dismutase (SOD)) and thus potentially cause the oxidative stress in moss *Atrichum undulatum* (Hedw.) P. Beauv *in vitro*.

The present study evaluated the impact of cesium acetate at four concentrations (0, 0.5, 1, and 1.5 mM) and different exposure times. Three treatments were used: Plants were grown in solid MS medium supplemented with different cesium concentrations for 5 weeks (T1); Plants were kept in water solution with different cesium concentrations for 2 (T2) or 24 (T3) hours and then transferred to the solid MS medium free of cesium for 5 weeks. Results clearly showed that cesium did not affect the activities of SOD and POX in T1 while CAT activity in *A. undulatum* increased with rise of the cesium concentration. For T2, the highest CAT activity was quantified in mosses kept in water solution with 0.5 mM concentration of cesium, while the highest SOD activity was detected in those kept in water solution with 1.5 mM cesium concentration. On the other hand, POX activity was even for all cesium concentrations. The control groups of T3 showed the highest activities of SOD and CAT. Opposite to that, POX manifested the highest activity for plants kept in water solution with 1.5 mM cesium concentration. Although addition of Cs in this form slightly affected enzymes activities depends on exposure time, those changes were not drastic suggesting that Cs in this form did not lead to oxidative burst in *A. undulatum*.