

## INSIGHTS INTO BIOLOGY OF THE MOSS *ENTOSTHODON HUNGARICUS*

*Marko Sabovljević<sup>1\*</sup>, Milorad Vujičić<sup>1</sup>, Beata Papp<sup>2</sup>, Nevena Petrović<sup>1</sup>, Bojan Petrović<sup>1</sup>, Erzsebet Szurdoki<sup>2</sup>, Aneta Sabovljević<sup>1</sup>*

<sup>1</sup>Institute of Botany and Garden, Faculty of Biology, University of Belgrade, Takovska 43, 11000 Belgrade, Serbia

<sup>2</sup>Department of Botany, Hungarian Natural History Museum H-1476 Budapest, Pf. 222, Hungary

\*[marko@bio.bg.ac.rs](mailto:marko@bio.bg.ac.rs)

### **Absztrakt:**

The moss *Entosthodon hungaricus* (Boros) Loeske is an funaroid moss species with scattered distribution and interesting ecology. It is considered as a facultative moss halophyte that inhabits the salty environment in central, eastern and southern Europe. It has a quick life span. Due to specific ecology, it is an endangered species in European level. For the purpose of the investigation of the biological features of this species, we have established in vitro culture and studied the feature of this moss. The best micropropagation and gametophyte development were achieved on BCD medium supplemented with 0.1 μM IBA and 0.03 μM BA based on multiplication index in vitro. The highest production of secondary protonema was achieved on BCD medium enriched with 0.1 μM IBA and 0.3 μM BA.

Also, the apogamous sporophytes of the moss *Entosthodon hungaricus* were reported for the first time. The plants under lower light intensity and constant water accessibility produced apogamous sporophytes under controlled conditions. We can assume the biological significance of such a phenomena, as the advantage for reproduction in short and quick life span in case that some other plants overgrown it and constrain the shortly available auspicious resources.

The in vitro exposure of *E. hungaricus* gametophytes to NaCl stress showed this species to be salt tolerant. Comparison of *E. hungaricus* with its relative

in the features as survival, index of multiplications (i.e. new shoots produced), total chlorophyll content in both species showed almost linearly decrease with NaCl concentration addition to the growth medium. In contrast, carotenoid content increased. The chlorophyll a/b ratio decreased in both species, *E. hungaricus* and *P. patens*. Catalases in *E. hungaricus* abruptly increase activity with low salt stress, and then slightly decrease by each further increase of salt stress. The ac-

tivity of peroxydases, after slight decrease in low salt stress conditions, increased with the higher salt concentration up to 300mM NaCl. With further salt increase, their activity significantly fell down. Catalase activity in *P. patens* show no clear pattern, while the activity of peroxidases abruptly decreased with salt stress increased. Superoxyddismutase had more activated izoformes in *E. hungaricus* than in *P. patens* during the salt stress, which implicate that enzymes of anti-oxidative system react to salt stress and take part in biology of tolerance to NaCl in mosses, as a first level response. All these parameters showed *E. hungaricus* to be more stress tolerant moss than *P. patens*.

The moss *E. hungaricus*, a part for deserving special attention to its biology due to its conservation values, express the interesting and unique characteristics among bryophytes and plants in general, which can elucidate many brain teaser of plant life or be used in biotechnology.