



**COPPER AND ZINC EFFECTS ON SPORE GERMINABILITY OF RARE AND THREATENED MOSS *PHYSCOMITRIUM EURYSTOMUM***

A réz és a cink hatása a ritka és veszélyeztetett *Physcomitrium eurystomum* lombosmoha spóráinak csírázására

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*Physcomitrium eurystomum* (Funariaceae) is a rare and threatened ephemeric acrocarpous moss on the European continent (IUCN:VU; EU28:EN). It manifests a shuttle life strategy with fast ontogenesis that takes only a couple of weeks to complete (spore to spore) on ephemeral muddy soil deposits in the vicinity of water bodies. As a part of the species conservation action plan, axenic *in vitro* cultures were developed and propagated on a minimal KNOP media. Afterward, the sporophyte phase was induced in order to obtain germplasm of viable spores that can be used for species propagation and which is of great importance for species conservation as it preserves genetic diversity due to meiosis occurring in a process of spore formation. Using this germplasm of viable spores, a conservation physiology approach was conducted in order to examine the effects of zinc and copper on the spore germinability of the species, as potentially toxic elements, such as these two, can be found in water bodies affecting this species sites and this present a real threat for species survival. Spores produced in laboratory conditions to avoid population pressure were divided into the aliquots, and these were exposed to two concentration levels (200  $\mu$ M and 700  $\mu$ M) of zinc and copper acetate for two hours, prior to rinsing the material and placing it on KNOP minimal media. Germination percentage was examined each 4 days, subsequently up to 44 days until fully developed protonemal buds emerged, whose number was also compared among the experimental groups through time. It was observed that all treated experimental groups had a lower germination percentage compared to the control group. However, copper acetate had a much stronger inhibitory effect on spore germinability in both concentrations than the other treated experimental groups which showed similar germination percentages, including plants treated with sterile water. In addition, the number of newly formed protonemal buds of the treated plants was lagging behind the control groups, especially when treated with copper acetate, but the difference seems to be smaller in later time categories suggesting that they can potentially overcome the negative effect of temporary exposure to copper and complete their life cycle.