

---

# INVESTIGATION OF HYPORHEIC BIOFILMS OF THE VLTAVA RIVER IN ŠUMAVA NATIONAL PARK WITH REGARD TO JUVENILE PEARL MUSSELS, THEIR FEEDING REQUIREMENTS AND SUFFICIENT OXYGEN SATURATION OF INTERSTITIAL WATER

**CABLOVA, R.<sup>1</sup>; RULÍK, M.<sup>2</sup>; CABLA, A.<sup>3</sup>; FIRLOVA, M.<sup>2</sup>**

<sup>1</sup>T. G. Masaryk Water Research Institute Prague

<sup>2</sup>Palacký University in Olomouc, Faculty of Science

<sup>3</sup>University of Economics in Prague, Faculty of Informatics and Statistics

**Keywords:** biofilm – TOC – polysaccharides – oxygen – respiration – pearl mussel

The research on biofilms has been ongoing within the project “Strengthening and Protection of the Pearl Mussel Population in Šumava NP” since 2018, when suitable research methods and procedures for studying the development of biofilms on hyporheic sediments (e.g. incubation of glass beads versus incubation of river sediment, granulometric survey of bottom sediments) were sought and tested, and the most suitable locations for the placement of experimental facilities were selected. In 2019, a three-month trial study of hyporheic biofilms in the Vltava River in Šumava NP was carried out at three selected sites with respect to juvenile pearl mussels, their feeding requirements and sufficient oxygen saturation of the interstitial water. The aim of this research was to validate the chosen methods and the efficiency of experimental devices for monitoring the development and quantification of hyporheic biofilms growing on incubated river sediment over time; monitoring the content and concentration of dissolved oxygen in interstitial water and its changes in relation to the growing biomass of hyporheic biofilms.

This paper focuses on the research on hyporheic biofilms of the Vltava River in Šumava NP, which was carried out at the same sites from April to November 2020, following a trial research in 2019. The results of the analyses and measurements provide corresponding values of oxygen, temperature and biofilm biomass typical for a foothill stream of oligotrophic character in the protected area. The oxygen saturation of the interstitial water is sufficient for the river pearl mussel for most of the year, with the exception of the summer period when sudden drops in concentration occurred at the monitored sites, for which we do not yet have a satisfactory explanation. Detection of polysaccharides as a proxy for microbial biofilm together with measured total organic carbon (TOC) values on incubated sediment suggest a sufficient food base for juvenile pearl mussels inhabiting the interstitial hyporheic environment of the Vltava River.

A complete evaluation of our monitoring will be conducted after the completion of the study, which is still ongoing this year 2021, and will provide us with the opportunity to compare the data with each other over two years.