

# Monitoring of Mercury and Arsenic in Water Samples from Proximity to Abandoned Cinnabar Mine

Pavína Pelcová<sup>1</sup>, Vendula Smolíková<sup>1,2</sup>, Andrea Ridošková<sup>1,3</sup>, Jana Hrachovinová<sup>1</sup>, Jan Grmela<sup>4</sup>

<sup>1</sup>Department of Chemistry and Biochemistry, Mendel University in Brno

Zemědělská 1, Brno, Czech Republic

pavlina.pelcova@mendelu.cz; vendula.smolikova@mendelu.cz; andrea.ridoskova@mendelu.cz;

jana.hrachovinova@mendelu.cz

<sup>2</sup>Central European Institute of Technology, Brno University of Technology

Purkynova 123, Brno, Czech Republic

<sup>3</sup>Central European Institute of Technology, Mendel University in Brno

Zemědělska 1, CZ-61300, Brno, Czech Republic

<sup>4</sup>Department of Zoology, Fisheries, Hydrobiology and Apiculture

Zemědělská 1, Brno, Czech Republic

jan.grmela@mendelu.cz

**Abstract** - Concentrations of mercury and arsenic were monitored in water samples from the Zászkalská water reservoir (Czech Republic) and its tributaries. The total mercury concentration in the reservoir ranged between 0.06–0.11  $\mu\text{g L}^{-1}$  and in tributaries between 0.14–0.20  $\mu\text{g L}^{-1}$ . The effect of water erosion from abandoned cinnabar mine on mercury concentration in tributaries and reservoir was observed. The arsenic concentrations in water samples were between 0.21–0.54  $\mu\text{g L}^{-1}$ . The 98±10% of arsenic concentration in the water was determined as potentially bioavailable, whereas only 7–20% of the total mercury concentration in the water was determined as bioavailable using diffusive gradients in thin films technique.

**Keywords:** Heavy metal, Cinnabar mine, Water sample, Metal bioavailability.

## 1. Introduction

Although the cinnabar mine is abandoned and there is no active mining, the surrounding environment can be significantly contaminated by