



ALMA MATER STUDIORUM  
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DIPARTIMENTO DI SCIENZE MEDICHE VETERINARIE



UNIMORE



AISETOV



FESTEM

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**TRACE ELEMENTS IN LIVING ORGANISMS - AISETOV**

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*Department of Veterinary Medical Sciences DIMEVET  
Alma Mater Studiorum, University of Bologna*

**The role of trace elements in health: from healthy  
environments to healthy living organisms**

**ABSTRACT BOOK**

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**P-02. Accumulation of cadmium, copper and zinc in the bivalve mollusks from the reservoirs of power plants**

Oksana Stoliar<sup>1</sup>, Gunta Sprinģe<sup>2</sup>, Lesya Gnatyshyna<sup>1,3</sup>, Vira Homa<sup>1</sup>,  
 Oksana Horyn<sup>1</sup>, Agnija Skuja<sup>2</sup>, Ivars Druvietis<sup>2</sup>, Dāvis Ozoliņš<sup>2</sup>, Ilga Kokorite<sup>2</sup>,  
 Viktoria Martinyuk<sup>1</sup>, Halina Falfushynska<sup>1</sup>, Lyubomir Tsaryk<sup>1</sup>, Natalya Mischuk<sup>1</sup>

<sup>1</sup>Volodymyr Hnatyuk Ternopil National Pedagogical University, Ukraine

<sup>2</sup>University of Latvia, Latvia

<sup>3</sup>I.Ya. Horbachevsky Ternopil State Medical University, Ukraine

Power plants (PPs) (nuclear, fuel or hydropower, NPPs, TPPs and HPPs correspondingly) are equipped with reservoirs that accumulate toxic effluents and have elevated temperature of water (NPPs and TPPs) or disturb the water flow (HPPs). The aim of this study was to evaluate the impact of the PPs on the accumulation of metals (Zn, Cu, Cd) in the bivalve mollusks. Specimens of *Unio tumidus* in Ukraine and *Dreissena polymorpha* in Latvia were sampled in the reservoirs of two TPPs and one NPPs, before and after dams of two HPPs at the tributaries of the river Dniester and Pripyat (upper streams) (Ukraine) and in the reservoir of Riga HPP on the river Daugava (Latvia) and pristine ponds in both countries. The concentrations of metals in the metallothioneins (MTs) and thiols (MT-SH, GSH&GSSG) were determined in the soft tissues. Expectedly, the mollusks from TPPs accumulated highest concentrations of Zn and Cu but not Cd. In the MTs, highest concentration of Cu was detected in the mollusks from NPP in accordance with its high level in the water. However, the level of Zn and Cd in the MTs was highest in the pristine sites. The level of MT-SH in Unionidae mollusk was highest among all studied groups in the mollusks from NPP and lowest in the mollusks from both TPPs. For the *D. polymorpha*, the difference in the MT-SH levels between the sites was not found, but the level of GSH and GSH/GSSG ratio was lower in the mollusks from the reservoir. The ratio of MT-SH to metalated (Zn, Cu, Cd)-MTs was highest in the mollusks from the TPPs despite these reservoirs were highly polluted by metals. To summarizing, the inability of MTs to bind the toxic metals reflected the common impact of chemical and heat pollution in the reservoirs of PPs.