



**“Gheorghe Asachi” Technical University of Iasi, Romania**



---

## **TRACE ELEMENTS IN FISH TISSUE WITH COMMERCIAL VALUE OF THE DANUBE DELTA BIOSPHERE RESERVE**

**Adrian Burada<sup>1\*</sup>, Liliana Teodorof<sup>1</sup>, Cristina Despina<sup>1</sup>, Daniela Seceleanu-Odor<sup>1</sup>,  
Mihaela Tudor<sup>1</sup>, Orhan Ibram<sup>1</sup>, Ion Năvodaru<sup>1</sup>, Gabriel Murariu<sup>2</sup>,  
Cătălina Maria Țopa<sup>2</sup>, Marian Tudor<sup>1</sup>**

<sup>1</sup>Danube Delta National Institute for Research and Development, 165 Babadag Street, 820 112, Tulcea, Romania

<sup>2</sup>“Dunărea de Jos” University of Galati, European Center of Excellence for the Environment, Faculty of Sciences and Environment, 111 Domneasca Street, 800201, Galati, Romania

---

### **Abstract**

Researches and analysis of heavy metals concentrations in the fish species exploited as a food source are of great interest due to long term toxic effects on human health even at very low concentrations. Therefore, we have conducted this study in an area of great interest in terms of aquatic biodiversity, but also of tourism and trade. Depending on the degree of toxicity in delta aquatic ichthyofauna, five heavy metals (Cr, Cu, Hg, Ni, Pb) and a metalloid (As) concentrations were measured in the muscle tissue of fifteen commercial value fish species in order to assess their impact on human health.

Samples were collected seasonally (twice a year) between 2013-2014 from Somova-Parches aquatic complex (situated near Tulcea - Romania industrial area in predeltaic area) and four representative aquatic complexes for Danube Delta, respectively Sontea-Fortuna, Matita-Merhei, Gorgova-Uzlina and Rosu-Puiu.

The determination of elements from collected samples was done differently, mercury was analysed by cold vapor atomic absorption, while the other five elements (arsenic, chromium, copper, nickel and lead) were determined using mass spectrometry with inductively coupled plasma.

The investigations of heavy metals revealed interspecific differences, important not only because of each specie particularities and food chain, but also for intraspecific variation caused by geographical location. The statistical analysis of the 4800 measurements in correlation with the analysis of the bioaccumulation factor (BCF) reflected the degree of contamination on the exploited Danube Delta Biosphere Reserve fish resources and also showed an irregular distribution of heavy metals and metalloids depending on anthropogenic pollutants.

*Key words:* bioconcentration factor, Danube Delta, heavy metals

*Received: February, 2016; Revised final: November, 2016 Accepted: December, 2016*

---