

Trace elements concentrations in aquatic biota from the Iron Gates wetlands in Romania

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Abstract. Concentration of four heavy metals was studied in living organisms from the wetlands ecosystems within the Iron Gates Natural Park in Romania. Samples included aquatic plants (*Ceratophyllum ssp.*, *Potamogeton pectinatus*, *Potamogeton natans*), molluscs (*Sinanodonta woodiana*, *Unio tumidus*, *Unio pictorum*) and fish (*Silurus glanis*, *Sander lucioperca*, *Aspius aspius*, *Cyprinus carpio*, *Carassius gibelio*). Metals organotropism in fish samples (gills, liver, muscle, eggs) has been studied (Kojadinovici et al., 2007; Foata et al., 2009; Dutton and Fisher, 2011; David et al., 2012). Metal contamination of the wetland ecosystems in the Iron Gates Natural Park has been documented in the past for sediments (Matache et al., 2002) and soils (Matache et al., 2003). This is a consequence of the mining and quarrying activities performed in the Moldova Noua region between 1960's and 2000's. Zinc is the main metal contaminant in all categories of collected samples. For fish muscle tissue (part of the fish mainly consumed by the local inhabitants), comparison with EU standards has been performed. Issues related to human health appear especially for cadmium (EC, 2006). *Potamogeton pectinatus* is the least accumulating plant species, whilst *Potamogeton natans* and *Ceratophyllum ssp.* had shown similar accumulation capacities of the trace elements.

Key words: Heavy metals, wetlands, fish, plants, molluscs

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References

- Dutton J, Fisher NS. Bioaccumulation of As, Cd, Cr, Hg(II), and MeHg in killifish (*Fundulus heteroclitus*) from amphipod and worm prey. *Sci Total Environ* 2011; 409: 3438-47.
- Foata J, Quilichini Y, Torres J, Pereira E, Spella MM, Mattei J, et al. Comparison of arsenic and antimony

contents in tissues and organs of brown trout caught from the river Presa polluted by ancient mining practices and from the river Bravona in Corsica (France): a survey study. *Arch Environ Contam Toxicol* 2009; 57: 581-9.

Kojadinovic J, Potier M, Le Corre M, Cosson RP, Bustamante P. Bioaccumulation of trace elements in pelagic fish from the Western Indian Ocean. *Environ Pollut* 2007; 146: 548-66.

David, IG, Matache ML, Tudorache, A, Chisamera, G, Rozyłowicz, L, Radu, GL, Food chain biomagnification of heavy metals in samples from the Lower Prut Floodplain Natural Park. *Environ Eng Manag J* 2012; 11: 69-74

Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2006R1881:20100701:EN:PDF>

Matache, M, Patroescu, C, Patroescu-Klotz, IV, Evoluția concentrației metalelor grele în sedimente acvifere

dunărene pe tronsonul Baziaș – Porțile de Fier I
(1996-1999), Rev Chim 2002; 53: 623-626
Matache, M, Rozyłowicz, L, Ropotă, M, Pătroescu, C,

Heavy Metals Contamination Of Soils Surrounding
Waste Deposits In Romania. J Phys IV 2003; 107:
851-854.