

Ecotoxicology in the Danube River Basin

Editorial

Dear Reader

Ecotoxicology has emerged in 1969 and is a relatively young scientific discipline. Defined as “ecology in the presence of toxicants” (Chapman 2002), it is truly interdisciplinary and integrates the effects of environmentally available toxic substances (stressors) across all levels of biological organisation from the molecular to individual organisms, whole communities and ecosystems. Ecotoxicological studies do not only deal with lab experiments by developing toxicity tests, but also are closely linked with in situ bio-monitoring of (aquatic) ecosystems. Since humans are an integrative part of ecosystems and persistent toxic chemicals may accumulate in the food chain, ecotoxicology is of vital interest to health issues across the globe. Today, ecotoxicology gets new stimulus by elucidating the level of genoms and researching sub-lethal effects.

While there are myriads of scientific literature on ecotoxicology, this topic so far had only limited attention in the Danube River Basin. This is evidenced in the actual draft Danube River Basin Management Plan (DRBMP) of the ICPDR. Given the legislative framework of the European WFD (e.g., list of priority hazardous substances, Directive 91/414/EEC regulating plant protection products, Biocidal Product Directive 98/8/EC, and REACH EC/1907/2006 – regulating registration, authorisation and restriction of chemical substances), this may change in the future. However, implementation of these Directives will need great efforts as an economically powerful chemical industry behind must change its strategy and cooperate to assess risks of toxicity and ban end-of-pipe solutions. Science, on the other hand, can contribute by elaborating threshold values and predictions of the effects of pollution, thus providing the basis for sound, efficient and effective measures and ac-

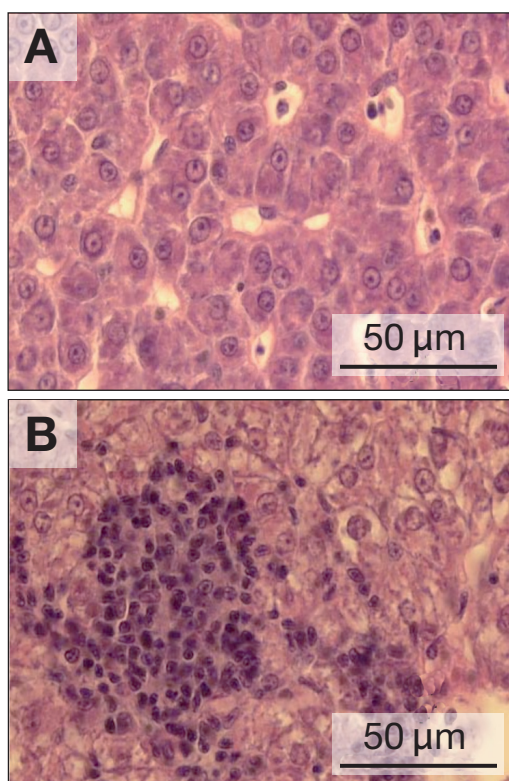


Figure 1. Histopathology of liver tissues of sneep (*Chondrostoma nasus*) in the Mures River (Romania) downstream of heavy metal mining sites. Figure 1A shows natural tissue with regularly shaped hepatocytes, round nuclei and eosin-positive cytoplasm from an uncontaminated site. Figure 1B shows tissue damaged by lymphocytic and macrophage infiltration, induced by accumulation of high Cadmium and Copper levels in livers. Such investigations contribute to detect contaminated rivers. (Reference: Triebskorn R et al. (2008): Monitoring pollution in River Mures, Romania, part II: Metal accumulation and histopathology in fish. *Environ Monit Assess* 141, 177–188)

tions to restore ecosystem function and establish human health standards.

Danube News 20 provides information on the state-of-the-art of ecotoxicology, toxicity tests, legal standards, biomonitoring and human health, with specific attention to the Danube River Basin. Although human society is exposed to an ever increasing cocktail of chemical substances that change and mix in the environment, public awareness about toxicity is surprisingly low. As long as people are not killed by poisonous substances the attention in the media is small. Spectacular fish kills upon accidental spills may be reported, but long-term chronic and sub-lethal aspects are highly neglected. IAD hopes to make a valuable contribution to stimulate respective discussion and research, and to propagate an important environmental issue.

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Hydrological catchment of the River Danube

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