

O 26. WHAT CAN MULTI-BIOMARKER APPROACH TELLS US ABOUT THE IMPACT OF POLLUTION ON FRESHWATER BIOTA HEALTH?

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ABSTRACT: The health of freshwater ecosystems and their biota exposed to continuous detrimental effects of environmental contaminants can be better assessed by integrating analytical chemical analysis with carefully selected biological endpoints measured in tissues of species of concern. These biological endpoints include molecular, biochemical and physiological markers (i.e. biomarkers) that when integrated, can clarify issues of contaminant bioavailability, bioaccumulation and ecological effects while enabling a better understanding of the effects of non-chemical stressors. Here, a battery of biomarkers, devised to measure cellular damage, antioxidant enzyme activity and physiological impairment, were combined with chemical analysis of water column, sediment and tissue, to determine exposure to and the effects of pollution at sites within Sitnica River (Kosovo). Carp fish, *Cyprinus carpio*, collected in situ through electrofishing were used as test species to determine the possible alterations in biochemical and physiological biomarkers. Our results confirmed a significant increase of hepatic alanine transaminase (ALT), aspartate transaminase (AST), glutathione-S-transferase (GST), catalase (CAT) and superoxide-dismutase (SOD) in blood. Both, blood glucose (GLU) and cortisol concentration were also significantly increased. Alteration in liver histological structure, increased in the frequency of micronuclei (MN) and nuclear abnormalities (ENA) in erythrocytes, were the most discriminating biomarkers among sites. This holistic approach to environmental assessment is encouraged as it helps to identify the integrated impact of chemical contamination on organisms and to provide a realistic measure of environmental quality.

Keywords: Multi-biomarker approach, Freshwater biota health, Pollution