

## BIOCHEMICAL PARAMETERS OF BLOOD PLASMA AND CONTENT OF MICROCYSTINS IN TISSUES OF COMMON CARP (*CYPRINUS CARPIO* L.) FROM HYPERTROPHIC POND WITH CYANOBACTERIAL WATER BLOOM

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The aim of this study was to evaluate the influence of toxic cyanobacterial water blooms on the blood plasma parameters and content of microcystins in the tissues of the common carp (*Cyprinus carpio* L.). Fish (average body mass  $2176 \pm 697$  g) were exposed in hypertrophic pond to a natural cyanobacterial water bloom (dominated by *Planktothrix agardhii*, *Pseudanabaena limnetica* and *Limnothrix redekei*,  $0.3 - 21.7 \cdot 10^6$  cells/ml), which contained microcystins (total concentration  $20 - 181 \mu\text{g}\cdot\text{g}^{-1}$  (DW), concentration in water  $0.3 - 9.5 \mu\text{g/l}$ ). Water parameters during the experiments were as follows: water temperature  $3.0 - 24.1$  °C, dissolved oxygen  $43 - 112$  %, pH  $7.7 - 9.7$ , transparency  $0 - 0.25$  m and chlorophyll a  $275 - 2309 \mu\text{g/l}$ . Biochemical parameters as total protein (TP), activities of aminotransferases (ALT, AST), activity of lactate dehydrogenase (LDH), alkaline phosphatase (ALP), acid phosphatase (ACP), cholinesterase (CHE), cholesterol (CHOL), total bilirubin (BIL), amylase (AMS), glucose (GLU), lactate (LACT), creatinine (CRE), albumin (ALB), triglyceride (TG), lipase (LIP), urea (UREA) and electrolyte (Na, K, Cl, Ca, Mg, P, Fe) were analyzed about 89 fish in 14-days interval from 10.7. to 14. 11. 2007. Our results demonstrated high variability and fluctuations of investigated parameters. Toxicity and density of cyanobacterial water blooms had important role for specific individual hematological indices such as LACT, CHOL or ALT. Concentrations of microcystins (MCs) in the muscle and liver (ng MCs per gram of the tissue fresh weight, f.w.) in the same fish were determined by HPLC coupled with mass spectrometer. Concentrations of microcystins were under limit of detection (LOD  $0.31$  ng/g f.w. for liver and  $0.13$  ng/g f.w. for muscle) in all fish during monitored period. Our study demonstrates that although known cyanobacterial toxins microcystins were not detected in the fish exposed to cyanobacterial water blooms, modulations of biochemical parameters indicate apparent effects of cyanobacteria on fish physiology.

Keywords: biochemical profile of blood, microcystins, common carp

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