

Animal welfare, etológia és tartástechnológia



Animal welfare, ethology and housing systems

Volume 9

Issue 3

Különszám/Special Issue

Gödöllő

2013

STRUCTURAL CHANGES IN THE POSTERIOR KIDNEY OF FISH EXPOSED TO MANCOZEB

Hanna LUTNICKA¹, Agnieszka LUDWIKOWSKA¹, Anna PECIO², Bartosz BOJARSKI¹

University of Agriculture in Krakow, Faculty of Animal Science, Department of Poultry and Fur Animal Breeding and Animal Hygiene, Poland¹
Jagiellonian University, Institute of Zoology, Department of Comparative Anatomy, Poland²

ABSTRACT

Fungicides, including mancozeb, are widely used in agriculture in the world. The low or very low concentrations of these pesticides are noted in surface waters - the main source for fish culture. They can influence fish inner organs causing pathological changes observed only on a cell's level. A kidney is an important organ secreting toxins metabolites. Fish posterior kidney have two different parts: haematopoietic tissue and renal parts (excretory tissue). The aim of the study was to get to know if the fungicide mancozeb causes the ultrastructural lesions in posterior kidney of fish.

Key words: fungicide, mancozeb, fish posterior kidney, ultrastructural changes

Material and methods

Carp *Cyprinus carpio* L. (mean weight \pm sd, 50 ± 10 g) was exposed for 14 days, in aquaria conditions, to the fungicide mancozeb in concentration 1 mg L^{-1} . After exposure fish were transferred to the clean water for the next 30 days for a possible recovery. Kidneys were sampled after 14 days of exposure and at the end of the recovery period. Ultrastructural changes were studied by transmission electron microscopy.

Results

The fungicide mancozeb caused pathological lesions in carp kidney. After the exposure the most important lesions were observed in hematopoietic tissue. The maturing blood cells were separated from themselves. They had different, not natural shapes/forms because of the cell's fragmentation process. In the excretory part the epithelial cells adhesion could be seen. The structure of the most of mitochondria of the cells was correct. Only some of them were locally damaged or a process of deliquescence was observed.

After the recovery period (30 days) in the hematopoietic tissue the same lesions as noticed after exposure were observed. In epithelial cells increase of RER could be seen in relation to the RER observed after exposure to the fungicide. Intensive RER fragmentation process was observed, too. Numerous RER was present in ribosomes. The recovery time was too short for the complete tissue repair.

The work has been financially supported by N N 304 279440