INTRODUCTION

Recently, ultrastructural analysis is the tool used in order to evaluate fish health state. It is a very sensitive method which shows alteration and adaptation lesions in the hepatocytes organelles.

The effect of two different technologies of rainbow trout farming, open system with a single flow of water (OS) and recirculation system with multiple use of water (RS), on ultrastructural pattern of hepatocytes was evaluated as the consequence of a novel method.

MATERIAL AND METHODS

The study has been carried out on autumn 2010, spring and autumn 2011 and spring 2012 on the rainbow trout from 6 farms. Three farms bred fish extensively (single water use i.e. open breeding farms: A - C) and 3 applied recirculation (fish farms with closed water system: D - F). The research included trout weighing 350 - 500 g (S), and 501 - 850 g (B), n = 20, fed the same feed. Liver samples were fixed in 2.5% paraformaldehyde and 2% glutaraldehyde in a phosphate buffer (pH 7.4). Ultrathin liver sections were embedded in Epon 812 and evaluated with the use of Opton microscope (Germany).

RESULTS

Ultrastructural lesions were found mostly in single hepatocytes. In some cases they were also seen in clusters of these cells. Relatively the lesions were the most numerous in mitochondria (polymorphism, blurred the structure of crusta, swelling, dens bodies), and slightly less numerous in the rough endoplasmic reticulum (proliferation, enlarged channels). Lipid drops were localized mostly in the periphery of hepatocytes. Abnormalities of the shape of the nuclei or abnormalities in heterochromatic distribution were seen comparatively seldom. The localization of changes indicates on their adaptive or damaging character. Damaging submicroscopic processes also come from the focal necrosis of hepatocytes.

A - C: Fig. 1 - 5; D - F: Fig. 6 - 10.

CONCLUSION

The results indicate that rainbow trout raised in both farming technologies are characterized by small deviations in hepatic ultrastructure. However, the changes were observed more often in fish which were caught in the autumn and in the fish from the group B. Moreover, they were expressed more intensively in fish from RS than the OS technology.

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