ULTRASTRUCTURAL PATTERN OF THE LIVER IN RAINBOW TROUT (ONCORHYNCHUS MYKIS, WALBAUM 1792) REARED EXTENSIVLY (OS) AND INTENSIVLY (RS)

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INTRODUCTION

There’s tendency to develop intensive rainbow trout rearing with the use of water circulation system (RS) instead of extensive rearing - open system (OS). The study presents morphology of hepatocytes organelles in rainbow trout reared according to the rules of these technologies. In this case 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.

MATERIAL AND METHODS

Forty trout were taken from 3 fish farms of OS and 3 of RS type in the spring and autumn in the period of two years. Each time 20 fish of 350 – 500 g b.m. (S) and 20 of 501 – 800 g b.m. (B) – n = 20, were taken. The fish were 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. From the blocks semithin sections were prepared, which were then stained with the method of Levis and Knight for determination the proper site for making ultrathin sections. Liver was evaluated with the use of TEM Opton microscope (Zeiss, Germany).

RESULTS

Ultrastructural lesions were observed mostly in single hepatocytes and in some cases they were also seen in clusters of these cells. Ultrastructural pattern of the liver showed minor lesions in mitochondria (swelling, dense bodies and sporadically effaced crista structure and rarefaction of matrix). Myelin-like structures and partial necrosis of hepatocytes as well as mitochondria proliferation and their polymorphism were sporadically found. Slightly less numerous lesions were in the rough endoplasmic reticulum (proliferation, enlarged channels). Steatosis simplex was noted quite frequently, especially in the fish B. 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.

OS: Fig. 1-5; RS: Fig 6-10; S: Fig. 3,5,6,8,9; B: Fig. 1,2,4,7,10.

CONCLUSION

The results indicate that rainbow trout raised in both farming technologies are characterized by small deviations in hepatic ultrastructure. Ultrastructural analysis showed minor lesions - similar in the fish from OS and RS. However they were slightly more intensive in RS fish, especially in the autumn. Ultrastructural pattern of the trout’s liver was more diversified between fish from the particular fish farms.

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