SUMMARY

Rainbow trout (Oncorhynchus mykiss Walbaum, 1792) is the leading species of Polish aquaculture, as well as one of the most important species of farmed fish in Europe and globally. The world population is estimated to reach 10 billion by 2050. To meet the expected nutritional requirements of a growing population, aquatic animal production must double by 2050, and any increase will have to come from aquaculture as environmental opportunities are compromised. Diseases are the greatest threat to the development of this food production sector and increasing climate changes may increase the risk of their emergence and spread. To minimize the risk of diseases and the need of fish treatment, it is important to take biosecurity and preventive measures, which include, inter alia, antiseptic baths. There is scarcity of scientific reports on the effects of doses of antiseptics on pathomorphology of trout, which are used in veterinary ichthyopathological practice. There is also a lack of standardized comparative studies that would allow a proper risk-benefit assessment in terms of health if a decision must be made to use antiseptic substances in trout farming.

The work aims to determine and compare the effect of single, double, and triple prophylactic bath treatments with the use of formaldehyde (dose of 0,25 kg m^{-3}), sodium chloride (dose of 20 kg m^{-3}) and copper (II) sulphate (dose of 0,003 kg m^{-3}) on the pathomorphology of the skin and gills of clinically healthy rainbow trout. Fry of rainbow trout in number 360, age 0+ with an average weight of 88,87±32,53 g was used in the experiment. Fragments of skin and gills were sampled from each animal and fixed in Davidson's fixative. Tissue sections were subjected to standard histopathological processing and then stained according to two methods: haematoxylin-eosin and Alcian blue/periodic acid–Schiff reagent. 1 440 slides were evaluated. The work uses semi-quantitative methods, such as the assessment of condition-related indicators and the histopathological evaluation with the use of organ reaction indices.

The obtained results showed that a single exposure to formalin at a dose of 0,25 kg m^{-3}, with safety measures in the form of increased aeration in tanks, had no toxic effect on the skin and had a very weak effect on the morphological image of trout gills. Formalin toxicity was found to increase with the use of subsequent doses. It has been shown that a single exposure to sodium chloride at a dose of 20 kg m^{-3} has stronger effect on the pathomorphology of the examined trout organs than a single exposure to formalin, and the difference between

effects of these substances on the pathomorphology of trout skin and gills decreases withthe exposure to the second and third dose. The study confirmed the toxic effect of sodium chloride to the analysed organs, manifested in the tested parameters. Regardless of the number of doses, the application of the bath treatment with copper (II) sulphate in the dose of 0,003 kg m^{-3} resulted in the most intense pathomorphological changes.