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Comparative study of impact of button mushroom compost and chemical fertilizer on head kidney and some blood biochemical parameters in warm water aquaculture

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Abstract

In this study the effect of button mushroom compost and chemical fertilizer on head kidney and some blood biochemical parameters in warm water aquaculture were examined. Fishes after transferring to six hemispherical pools for two months, received button mushroom compost and chemical fertilizer. In each group, 20 healthy fish with similar biometric characteristics were taken. After performing routine laboratory procedures, counting of red blood cells, differential white blood cell count with using the hemocytometer, hematocrit percentage using microhematocrit method and hemoglobin measurements were performed using standard hemoglobin cyanometric method. Specimens with a maximum thickness of 5 mm were also taken from the apical regions of the kidney. Following fixation in bouin's solution, the usual method of preparing sections of the tissue including dehydration with ethanol increase series, clearing with xylene and impregnation to paraffin was performed. Finally, samples were blocked in paraffin molds and then sections with thickness of 4µm - 6µm were cut using Leica semi-digital microtome and stained with hematoxylin-eosin. Then micrographs were studied as histomorphology method using Olympus's optical microscope equipped with Dinolite camera and a computer equipped with dinocapture software. Results showed that in four species of carp, only in *Ctenopharyngodon idella*, there was no significant difference between red blood cell count ($p>0.05$). There was also a significant difference in hemoglobin levels in *Hypophthalmichthys molitrix* and *Hypophthalmichthys nobilis* and only in *Ctenopharyngodon idella* the difference between hematocrit percentage was not significant ($p>0.05$). The results of microscopic studies of the head kidney showed an increase in interstitial connective tissue in control group compared to the treatment group, and in the control group, most of the space was occupied by cells. According to the recent findings, it can be concluded that button mushroom compost can be used as a suitable substitute for chemical fertilizers in warm water aquaculture.

Keywords: Compost, Chemical fertilizer, Kidney, Blood parameters, fresh water aquaculture

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