

The effect of Hydroenzyme XP dietary on growth, nutritional performance, and immune parameters in copper Oscar fish (*Astronotus ocellatus*)

Niknam moradi chehri¹
Mehrdad Shirinabadi²
Mansoureh Gholami^{3*}
Maryam Shapoori⁴

1, 2. Department of Natural Resources, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran.

Department of Biology, Central Tehran Branch, Islamic Azad University, Tehran, Iran.

Department of Natural Resources, Savadkooh Branch, Islamic Azad University, Savadkooh, Iran.

*Corresponding author:
gholami62@yahoo.com

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Abstract

Probiotics are live Microorganisms that can affect the host animal by improving their intestinal flora as supplements to improve growth performance. The present study was conducted to investigate the effect of using hydroenzyme xp as food supplement on growth performance, survival and immunity in copper oscar fish (*Astronotus ocellatus*) in 2020. For this purpose, one hundred and fifty (150) Oscar fish fingerlings with an average weight of $(1/5 \pm 0/2)$ grams were divided into 4 experimental groups and 1 control group. The experimental groups were provided with a diet containing 25, 50, 100 and 125 grams of hydroenzyme xp supplement in one ton of consumed food for 60 days. Biometry was done once every two weeks. After conducting normality test (Shapiro-Wilk) and ANOVA test and the comparison of averages at 0.05 confidence level by Duncan test, the results showed that feed conversion coefficient and protein efficiency in treatments 1, 2 and 3 were significantly different. Treatment 4 containing 125 grams of xp hydroenzyme compared to the above treatments and to the control group, significantly increased the feed conversion ratio and decreased the protein efficiency ratio ($P < 0.05$). Furthermore, treatment 3 had the highest amount of these two factors. Regarding the amount of food eaten, no significant difference was observed between the experimental and the control group ($P < 0.05$). The highest increase in body weight and specific growth rate (SGR) was related to treatment 3. Treatment 3 (containing 100 grams of hydroenzyme xp) had the greatest effect on increasing the amount of white blood cells and serum albumin in copper Oscars ($P > 0.05$). But the control group, treatment 4 and treatment 1 had no significant effect on the amount of white blood cells and serum albumin of copper oscars ($P < 0.05$). With regard to white blood cells, the lowest number was related to the control treatment, and in terms of albumin, the lowest number was related to treatment 4. Furthermore, compared to the control group and experimental treatments 1 and 4, treatment 3 had a significant effect on total protein and blood serum globulin. According to the obtained data, the use of hydroenzymexp supplement at the level of 100 grams per ton in the diet of Biomar can be recommended.

Keywords: Hydroenzyme xp supplement, Oscar fish (*Astronotus ocellatus*), Nutritional, Growth and immune parameters.