Effect of adding *Bacillus subtilis* and *B. licheniformis* mixture as a probiotic (Di-Pro Aqua™) to diet on some growth, hematology, and immunology indices of Common carp (*Cyprinus carpio*)

Milad Khaleghi[1]
Mehdi Soltani[2*]
Seyed Pezhman Hosseini Shekarabi[3]

1. M.Sc. Student, Department of Fisheries Science, Science and research branch, Islamic Azad University, Tehran, Iran
2. Professor, Department of Aquatic Animal Health, Faculty of Veterinary, University of Tehran, Tehran, Iran
3. Assistant Professor, Department of Fisheries Science, Science and Research Branch, Islamic Azad University, Tehran, Iran

***Corresponding author:**
msoltani@ut.ac.ir

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Abstract

In this study, effects of a commercial dietary probiotic mixture containg *Bacillus subtilis* and *B. licheniformis* was assessed on some growth, hematology, and immunology indices of common carp in Agricultural and Cultural Complex of Martyr Mehranzadeh, Khuzestan Province for 60 days. There was three treatments including 0.5 (T1), 0.7 (T2), and 0.9 (T3) g of the probiotic mixture per kg of feed and also a control group (without any probiotic supplementation) were designed. Each treatment with three replicates and each replicate had 35 fry fish (100±10 g initial weight) with 10.5 kg/m^3 density. Results showed that the highest growth performances including final weight, specific growth rate, practical protein ratio and practical feed ratio were observed in T3 ($P<0.05$). The lowest FCR (1.74) was calculated in T3 ($P<0.05$). Hemoglobin concentration, hematocrit, RBC and WBC and lysozyme (129.33 µg/L) levels were more in T3 compared to the other treatments ($P<0.05$). In conclusion, application of the probiotic mixture at 0.9 g/kg feed can improve growth performances and immunity system of fish and it is recommended to be added to the diet of common carp.

Keywords: Common carp, Growth, Immunity, Probiotic, *Bacillus licheniformis*, *Bacillus subtilis*.

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