

ARTICLE / INVESTIGACIÓN

Assessment of Thepax and Bio Boost for promoting microbial growth in common carp intestines *Cyprinus carpio*

Mohamed Al-Janabi, Jalal Al-Noor and Adel Y. Al-Dubakel*

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Aquaculture Unit, College of Agriculture, University of Basrah, Iraq.
Corresponding author: aaldubakel22@gmail.com

Abstract: The study aimed to evaluate the effect of Thepax and BioBoost as food additives on the microorganisms in the intestines of fish. From March 4 to October 22, the total number of common carp was 900 fish with an average weight of 163.41 ± 10.16 g and a density of 100 fish/cage; three replicates were used for each treatment. The fish were fed three times daily. The included T1(0%additive), T2(1g/kgThepax)and T3 (1 g/kgBioBoost). The highest final weight value is Thepax treatment (2209.34 g), followed by Bio Boost and control. Microorganisms showed significant differences ($P < 0.05$) in T2 for *Lactobacillus* sp. ($10^2 \times 65$ CFU/ml) followed by T3 ($10^2 \times 55$ CFU/ml) and control T1 ($10^2 \times 23$ CFU/ml), also for *Cellulomonas* sp. in T2 ($10^2 \times 54$ CFU/ml) followed by T3 ($10^2 \times 39$ CFU/ml) and control T1 ($10^2 \times 7$ CFU/ml). At the same time, *Aeromonas* sp. bacteria was higher in T1 ($10^2 \times 34$ CFU/ml) over the treatments of T2 and T3 ($10^2 \times 2$ CFU/ml) for both. We concluded the best additive was 1 g of Thepax / kg of feed in the recommended diets for common carp.

Key words: Thepax, Additives, Microorganisms, Intestines, Bacteria, *Lactobacillus*, Endo Bio Boost.

Introduction

Aquaculture is the fastest-growing food production and supports nearly 50% of all aquatic food for human consumption¹. The main objective of aquaculture is to increase production². During cultivation, fish may be exposed to various diseases, especially if they are stressed due to the deterioration of water quality and exposure to stressful conditions, which leads to significant economic losses³.

Antibiotics in aquaculture lead to many severe problems, such as antibiotic-resistant bacterial strains and antibiotic residues in fish muscles, which would cause serious public health effects on human consumers and environmental pollution^{4,5}. Therefore, finding safe and environmentally friendly alternatives is necessary to avoid the negative consequences of antibiotic use⁶. Most non-nutritive feed additives include antibiotics, immunostimulants, antioxidants, probiotics and prebiotics^{7,8}, which were added to improve diet quality, health, performance and feeding efficiency of fish⁹. Prebiotics are present in the cell wall of bacteria, yeasts and molds^{10,11}. Prebiotics primarily affect the host by stimulating the selective growth of one or a limited number of non-pathogenic bacteria in the fish's gut, resulting in improved host health. Lactic acid bacteria are the most important, as they are part of the natural microorganisms of the fish gut. All their strains are non-pathogenic, in addition to their antagonism against many types of pathogenic organisms through their production of lactic acid^{12,13}. The current study was conducted to evaluate the effect of Thepax and Bio Boost as feed additives on the microorganisms in the intestine of the common carp *Cyprinus carpio*.

Materials and methods

Study Site

The current study was accomplished in the ponds belonging to the Aquaculture Unit, which is located in the Agricultural Research and Experiment Station in Basrah Governorate (College of the Agriculture / University of Basrah), in Al-Harthia District, 16 km north of Basrah (300 65' 64.6"N, 470 74' 79.5"E). The current experiment was conducted in a large pond with 2500 m². The water was provided with electric pumps from one branch of the Shatt Al-Arab river.

Fishes and Experimental Cages

Experimental cages were made of polyethylene with dimensions of length \times width \times height (3 \times 1.7 \times 1.8 m) and enclosed by external nets (10 \times 10 mm). The cages were placed inside the earthen pond which was filled with water at the height of 1.5m; ventilation fans were employed to avoid the shortage of oxygen, especially during high temperatures. There were 600 common carp fish with an average weight of 163.41 ± 10.16 g distributed in the cages at 100 fish/cage density; two replications for each treatment were used.

Feeding Management

Experimental diets were produced at the feed production plant of the Agricultural Advisory Office, Faculty of Agriculture, University of Basra. Three diets were formulated, which included a control T1 (0% additive), T2 (1g/kg Thepax) and T3 (1g/kg BioBoost). The pellet size was 6 mm.

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