

## Abstract

Grasshopper (*Ctenopharyngodon idella*) is an important and marketable carp species, and chitosan is one of the most suitable growth stimulator prebiotics in carps. Therefore, in the present study, the effect of chitosan probiotic on growth, survival and immunity of *Ctenopharyngodon idella* Juvenils for 56 days in a control treatment and three experimental treatments under the influence of prebiotics (1, 2.5 and 5 g/kg of diet) with 3 repetitions were examined. In each replicate, 20 fish were weaned with an mean weight of (21.28±0.092) for 8 weeks with experimental diets. Feeding with experimental rations was carried out on the basis of a maximum of 3% of live weight at two times per day. The results showed that chitosan had a significant effect on the growth performance of *Ctenopharyngodon idella*, so that final weight, final length, biomass and specific growth rate of grass carp was increased by chitosan increase, and its highest value was observed in fish fed with ration containing 5 g chitosan. The highest amount of condition factor also was obtained in fish fed with ration containing 1 and 5 g per kg chitosan. But with the increase in chitosan, the feed conversion ratio of *Ctenopharyngodon idella* decreased. Chitosan had a significant effect on white blood cells, hematocrit, hemoglobin and intracellular hemoglobin, and red blood cells in blood serum of grass carp. Chitosan reduces the number of white blood cells, hematocrit and Intracellular hemoglobin (MCH). The number of red blood cells decreased in fish fed with ration containing 1 and 2.5 g chitosan and increased in fish fed with ration containing 5 g chitosan. Chitosan had a significant effect on blood serum enzymes, so that the lowest levels of spartat aminotransferase (40.33 ± 2.08) and lactate dehydrogenase (818.68 ± 1.53) and the highest alkaline phosphatase (302.33 ± 2.52) was observed in fish fed with ration containing 2.5 g chitosan. Chitosan increased the resistance of wild boar to counteract the stress of temperature, but reduced salt stress in countering stress. It can be concluded that the complementary role of chitosan in the development of *Ctenopharyngodon idella* is positive, so that it can improve its growth indices and the best effective dose is 5 g per kg of food. Therefore, it is recommended to use this food supplement at reproduction and restocking centers of *Ctenopharyngodon idella*.

**Keywords:** Chitosan, Growth increase, Leukocyte, Salinity stress, *Ctenopharyngodon idella*.



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**Effect of the chitosan on growth performance,  
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