

Effects of transportation on stress indicators and biochemical parameters of the juvenile of common carp (*Cyprinus carpio*) using probiotic Bacilli and yeast

Hojatollah Jafaryan¹, Mahin Ranjdoust^{†*}, samira Jafaryan[†]

1,2,3- Fisheries Group, Faculty of Agriculture and Natural Resources, Gonbad University, Golestan

*Corresponding author g-mail: mahin. rnj@gmail.com

Abstract

The main concern in fish transportation is about minimizing stress during transportation. This study aims to find the changes in blood factor in 150 common Carp juveniles with (60.50±1.50 g) average weight in 12 h transportation. It was performed, five treatments and three replications for each treatment including control, Celmanax liquid yeast, probiotic bacilli (*Bacillus licheniformis*, *B. subtilis*, *B. polymyxa*, *B. laterosporus* and *B. circulans*), 0.5 g per liter salinity + Celmanax, 0.5 g per liter salinity + probiotic bacilli treatment. They were fed by diet supplemented with Celmanax probiotic at the level of 1 ml per kg, and by diet supplemented with probiotic bacilli at concentrations of 1×10⁶ CFU per 100 g food. During 90 days, the fishes were introduced to plastic bags in stocking density of 1 kg/m³. The control group had the highest levels of cortisol and ALT (p<0.05). The results of this study showed that by using Celmanax probiotic and probiotic bacilli in long-time transportation of Common Carp (over than 12 hours), can be reduced fish stress.

Keywords: Celmanax liquid yeast, probiotic Bacilli, biochemical parameters, transportation