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Effect of dietary probiotic on growth performance, feed utilization and stress resistance of guppy (*Poecilia reticulata*)

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The present study was conducted to investigate the influence of dietary supplementation of probiotic mixture, AQUALACT^{TM} on growth performance, feed utilization and stress resistance of guppy fish, *Poecilia reticulata*. Simultaneously, water quality parameters and total carotenoid content of experimental fish were monitored. At the end of the experiment, guppy fish were subjected to salinity (35 g/L) and temperature (40^0C) stress study. Four isonitrogenous (30% Protein) diets were prepared as CD (Control diet-no probiotic), 50PM (0.5% probiotic mix), 75PM (0.75% probiotic mix) and 100PM (1.0% probiotic mix). Twenty-eight days old, twelve male guppy fish (0.11 ± 0.11 g and 2.20 ± 0.05 cm) were introduced into four treatment groups with three replicates each. Fish were fed up to satiation twice daily for 42 days in aquarium conditions. Daily food consumption (~8 % body weight per day) was not significantly ($p > 0.05$) different among the treatments. Fish fed 75PM diet showed highest body weight (0.43 ± 0.01 g) and total length (3.35 ± 0.01 cm) ($p < 0.05$) at the end of the experimental period compared to fish in other treatments. Percentage ADG (Average Daily Gain), %SGR (Specific Growth Rate), HSI (Hepato-Somatic Index) were significantly ($p < 0.05$) higher in the 75PM, 100PM and 50PM probiotic supplemented groups compared to CD. Total carotenoid content of skin and muscles of fish in all probiotic supplemented groups were significantly higher (range 6.11-7.21 /g) compared to that of fish fed diet without any probiotic supplementation (4.54 ± 0.11 /g). Six fish were randomly sampled from each tank and subjected to stress test and the cumulative mortality was monitored at 3 min intervals over a 2h period. In the salinity stress test at 35 g/L fish fed with probiotic supplemented diets showed significantly better resistance (lower cumulative mortality index - CMI) than control group. However, CMI was not influenced by 40^0C temperature. It can be concluded that dietary probiotic supplementation (50PM, 75PM, 100PM) positively influenced the salinity stress resistance of fish as well as the coloration of fish. All the statistical analyses were accomplished with the SPSS statistical package (SPSS 16.0). Significant ($P < 0.05$) differences among means were followed by a post hoc comparison of means using Duncan multiple-range test to distinguish differences among treatment levels. Further, when considering the growth performance and feed utilization, 75PM supplementation level is the best level among all the tested treatments. Therefore, 0.75% probiotic diet can be used to enhance the growth performance, coloration and salinity stress resistance of guppy under aquarium conditions.

Keywords: AQUALACT^{TM}, *Poecilia reticulata*, probiotic