

Effects of the tank shape, water current control and rearing density on the survival rate, feeding, and growth of Pacific bluefin tuna, *Thunnus Orientalis* larvae

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Introduction

Although the development of seedling production technology is required, the mass production of Longtooth grouper (LTG) larvae is problematic. We reported that round-bottomed tanks are more effective at reducing sinking deaths than general flat-bottomed tanks. In this study, we evaluated the most appropriate water-current control systems for rearing larval LTG and examined the optimum flow speed for each condition and developmental stage.

Materials and Methods

Experiment I: Larvae were reared for 10 days in triplicate in four round-bottom tanks with pump flow rates of 500, 1000, 1500, and 2000 mL/min. Experiment II: Larvae were reared for 10 days in three experimental groups, set up in triplicate, in round-bottomed tanks with air flow rates of 40, 200, and 400 mL/min. Experiment III: Larvae were reared for 10 days in triplicate in four round-bottomed tanks with pump flow rates of 1500 mL/min and air flow rates of 200 mL/min. The flow rate rearing systems were changed from pumps to aeration on days 3 and 6.

Results and Discussion

Experiment I: Optimal survival rates and total lengths were obtained at the 1500 mL/min water-pump flow rate. Experiment II: The average survival rate was approximately 67% at the 40 and 200 mL/min aeration rates, which was significantly higher than that obtained at the 400 mL/min aeration rate. Experiment III: The survival rate of the aeration group was significantly higher than that of the pump groups. However, the survival rate for the group that had the flow system changed from pump to aeration on days 3 was approximately 80%, which was the highest. These results suggest that the optimum pump rate for LTG larva rearing is 1500 mL/min for the first 3 days and that the optimum air flow rate is 200 mL/min for the subsequent 3 to 10 days using semi-spherical round-bottomed tanks.