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Effect of a prebiotic on Macrobrachium rosenbergii (De Man, 1879) larvae growth and survival

Camargo W.N

Ghent University, Belgium, Email: williamc@gmail.com

Abstract

New products (e.g. prebiotics) are constantly being developed to maximize production, particularly at the hatchery level to improve fry or post-larvae (PL) quality. Gutacean?, is a novel product, which has not been tested in fresh water species since it requires some salinity to be able to have a positive effect on survival and growth. Hence, we investigated the effectiveness of Gutacean? in a brackish water media on the growth performance of the giant freshwater prawn Macrobrachium rosenbergii larvae, which requires brackish water during early development. Approximately 8,000 M. rosenbergii larvae (stage III) were treated with 200 µl Gutacean? for an hour in 40 L of brackish water (12.0 0.5 ppt). Afterwards, 6,000 treated larvae were individually counted in three groups of 2,000 (treatment in triplicates), along with 6,000 untreated larvae (control in triplicates), which were subjected to an identical handling procedure as the treated ones, and stocked (100 larvae /L) randomly in six hatching containers filled with 20 L of clear brackish water (50% water exchange per day), fitted with temperature controllers (28.0 0.5 C). Initial and final weights, shedding frequency and survival were recorded after 30 d, when the larvae reached the PL stage. Water quality parameters were maintained within ideal ranges. A significant difference (P>0.05) in survival rates of the treated (38.4%) vs. the control PLs (31.6%) could be observed, contrasting, with no significant difference (P<0.05) in final weights, nor in the final shedding frequency, among the treated and untreated (control) PLs. Further investigations are needed since the results in this study were mixed, perhaps by using other salinity levels.

This study aimed to study the optimization of probiotics and Lactobacillus sporogenes for survival, growth, biochemical composition and energy utilization of larvae of freshwater shrimp Macrobrachium rosenbergii (PL). Except for changes in probiotic levels, all the experimental diets were the same. The probiotic L. sporogenes was used in the experimental diet at 0%, 1%, 2%, 3% and 4%. These foods are administered to M. Macrobrachium rosenbergii PL 90 days. Food index parameters, such as SR, WG, SGR, FCE, and PER, were significantly higher in 4% of L. sporogenes (P <0.05), while FCR was significantly higher in 4%. (P <0.05)% of mixed L. sporogenes PL fed in the feed. This indicates that this food produced a higher growth rate than other experimental diets. Similarly, the approximate composition of total protein content, total free amino acids, total carbohydrates, and total lipids was significantly higher in 4% PL fed L. sporogenes (P <0.05). However, the difference in ash and moisture content recorded between the control group and the experimental group was negligible. Energy utilization parameters, such as feeding rate, absorption rate, conversion rate, and excretion rate, were significantly higher in the 4% PL diet mixed with L. sporogenes (P <0.05). The metabolic rate difference between the control group and the experimental group was not statistically significant. This indicates that there is no difference in energy loss between the control group and the experimental group. However, the incorporation of L. sporogenes with PL and diets produced better growth performance.

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