

Effects of Single and Combined Supplementation of *Lactobacillus plantarum* with dietary xylooligosaccharide on growth performance, body composition and physiological responses of sobaity (*Sparidentex hasta*) fingerling

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Abstract

The aim of this study was to evaluate the single and combined effects of dietary probiotic with prebiotic on growth performance, non-specific immune response, body composition, digestive enzymes activity and intestine bacterial flora of sobaity fingerling (*Sparidentex hasta*). For this purpose, 425 individuals of sobaity fingerlings were prepared with an average weight of 7.64 ± 0.3 g from the Mariculture Research Station of South Iranian Aquaculture Research Center. This study was carried out in a completely randomized design with four treatments and three replications (45 fish per each replication) in fiberglass tanks with 300 liters volume. Fish were fed with feed containing 0 (control group), 10^6 CFU probiotic per gram feed (treatment 1), 0.5 and 1 percent prebiotic plus 10^6 CFU probiotic per gram feed (treatment 2 and 3) at 4.5 percent of body weight for a period of 42 days. At the end of the experiment, body composition, intestine, blood, plasma and mucus samples were collected. The obtained results indicated that dietary prebiotic and probiotic did not change growth performance, intestine bacterial flora and non-specific immune response of sobaity ($P > 0.05$). Nonetheless, plasma bactericidal activity of control group was significantly higher than treatment 3 ($P < 0.05$). Moisture and protein content of treatment 2 showed significant difference compared to the control group ($P < 0.05$). The results of this study showed that digestive enzymes activity including alkaline protease, amylase and lipase affected by administration of dietary prebiotic and probiotic ($P < 0.05$). Overall, this study showed that single supplementation of probiotic and combination with prebiotic at the used amounts had no positive effects on growth performance and intestine bacterial flora and immune response (except plasma bactericidal activity) of sobaity but improve digestive enzymes activity.

Keywords: Probiotic, Innate immunity, Body composition, Digestive enzymes, Sobaity (*Sparidentex hasta*).

Table 1. Growth and feeding performance of sobaity juvenile according to the different treatments at the end of the experiment (mean \pm SE)

Table 2. Non-specific immune responses of sobaity juvenile according to the different treatments at the end of the experiment (mean \pm SE)

Table 3. Body composition of sobaity juvenile according to the different treatments at the end of the experiment (mean \pm SE)

Table 4. Digestive enzyme activity of sobaity juvenile according to the different treatments at the end of the experiment (mean \pm SE)

Table 5. Total colony bacteria counts of sobaity juvenile according to the different treatments at the end of the experiment (mean \pm SE)