Successful Co-Feeding of Asian Seabass, Lates calcarifer Larvae With Palm Oil-Based Microdiets and Live Feeds

ABSTRACT

Palm oil has been recognized as a high potential alternative dietary lipid source to reduce the reliance on expensive fish oil in aquaculture feeds. Unfortunately, most research studies were focusing on the juvenile or grow-out stage of aquatic species. This study was designed to develop weaning microdiets for Asian seabass larvae with dietary fish oil being replaced with crude palm oil (CPO) at 25, 50, and 75% (CPO25, CPO50, and CPO75) and refined bleached deodorized palm olein, refined palm oil (RPO) at 50 and 75% (RPO50 and RPO75) replacement levels. A fish-oil-based microdiet was used as a control treatment (FO100). The triplicate groups of fish larvae with initial weight and length of 1.71 ± 0.13 mg and 5.54 ± 0.34 mm, respectively, were stocked at 150 larvae/tank and co-fed with the experimental microdiets and live feeds (L-type rotifer and artemia). The final body weight (0.54–0.63 g) and specific growth rate (SGR) (12.8–13.13%/d) of fish-fed palm oil-based diets were significantly better than the control diet (0.42 g; 12.21%/day, respectively). In particular, RPO75 yielded the best SGR followed by RPO50, CPO75, CPO50, and CPO25. The feeding intake and feed conversion ratio (FCR) were not statistically different from other treatments (0.2–0.3 g/fish/d and 1.06–1.63, respectively). The survival rate of larvae-fed palm oil-based diets (33.11–46.67%) during the feeding trial was comparable to the control diet (39.33%). In the 65 ppt-salinity stress test at 25 DPH, there was no significant difference in terms of the survival rate of larvae fed the control diet and the CPO-based diets, but the lowest survival rate was observed in the RPO-based diets than the control diet. Higher final whole-body protein and lipid contents (15.3 ± 0.4 and 3.7 ± 0.0%, respectively) were observed in fish-fed CPO50 compared to other treatments. Generally, the replacement of fish oil with palm oil increased the palmitic acid (C:16:0) and oleic acid (C18:1n9) and significantly reduced the eicosapentaenoic acid (EPA) (C20:5n3) and docosahexaenoic acid (DHA) (C22:6n3) contents in both the microdiets and larval body, a common observation in this kind of investigation. Considering the good growth and survival of Asian seabass larvae in this study, availability of palm oil, and its competitive price compared to fish oil, it is suggested that weaning diets for Asian seabass larvae can be developed using palm oil as a partial source of dietary lipid.