

Effect of daily feeding ratio on growth and body composition of sub-adult olive flounder *Paralichthys olivaceus* fed extruded pellet during the summer season

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Introduction

Use of the extruded pellets (EP) is highly desirable for most of fish farm in terms of improved availability of nutrients in the diet, easy observation on fish feeding activity, reduced water pollution source in effluent discharged from fish farm and spread of disease, easy handling, and long storage time for later use. The formulation of EP to satisfy dietary nutrient requirements for olive flounder has been developed recently and commercially available EP is being adapted to many olive flounder farm in Korea. Excessive amount of feed supply commonly results to lower feed availability of fish, deteriorate of water quality in fish farm, and eventually increase fish production cost.

In the previous study, optimum daily feeding ratio for growth of juvenile olive flounder grown from 17 to 90 g has been reported to be 95% of satiation when fish were fed by the EP with various feeding ratio during summer season (Cho et al. 2006). However, optimum feed allowance for growth of fish could be largely affected by fish size as well. Therefore, In this study optimum daily feeding ratio for sub-adult olive flounder fed the EP was determined during the summer season.

Materials and Methods

Similar size of sub-adult olive flounder *Paralichthys olivaceus* were purchased from a private hatchery and transferred into the Lab. Thirteen fish (an average body weight of 319 g) per tank were randomly chosen and distributed into 15, 500 L flow-through tanks (water volume; 300 L). The flow rate of water into each tank was 16 L/min/tank. Water temperature ranged from 17.5 to 23.0°C (MeanS.D.: 21.1±1.3 3°C) since the feeding trial was performed during the summer season. Fish were fed for 7 days a week throughout the 10-week feeding trial. Five treatments of feeding ratio in 5% decrement with triplicates were used: 100 (satiation), 95, 90, 85 and 80% of satiation. Fish in the control group were hand-fed to apparent satiation, 100% of

satiation, twice a day at 0900 and 1700. The experimental diet contained 49.5% crude protein and 9.2% crude lipid with a gross energy level of 6.0 kcal/g diet, based on the previous studies (Lee et al. 2000, 2002).

At the end of the feeding trial, fish were collectively harvested and totally weighed. Five randomly chosen fish at the beginning and from each tank at the end of the feeding trial were sacrificed for proximate analysis based on standard method (AOAC, 1990). One-way ANOVA and Duncan's multiple range test were used to analyze the significance of the difference among the means of treatments through SAS version 9.1 (SAS Institute, Cary, NC, USA).

Results and Discussion

Weight gain of fish fed to 100% of satiation was significantly ($P < 0.05$) higher than that of fish fed to 85 and 80% of satiation, but not significantly ($P > 0.05$) different from that of fish fed to 95 and 90% of satiation. However, feed efficiency ratio, protein efficiency ratio and protein retention of fish was not significantly ($P > 0.05$) affected by feeding ratio. Hepatosomatic index and condition factor of fish was not significantly ($P > 0.05$) affected by feeding ratio. Moisture, crude protein and lipid, and ash content of the whole body of fish without liver or liver were not significantly ($P > 0.05$) affected by feeding ratio. In considering these results, optimum daily feeding ratio for growth of sub-adult olive flounder seemed to be 90% of satiation when fed the extruded pellet during the summer season.

References

- AOAC (Association of Official Analytical Chemists). 1990. Official Methods of Analysis. 15th edition. Association of Official Analytical Chemists. Arlington, VA, USA.
- Cho, S. H., S. Lee, B. H. Park, and S. Lee. 2006. Effect of feeding ratio on growth and body composition of juvenile olive flounder *Paralichthys olivaceus* fed extruded pellets during the summer season. *Aquaculture* 251:78-84.
- Lee, S., S. H. Cho, and K. D. Kim. 2000. Effects of dietary protein and energy levels on growth and body composition of juvenile flounder *Paralichthys olivaceus*. *Journal of the World Aquaculture Society* 31:306-315.
- Lee, S., C. S. Park, and I. C. Bang. 2002. Dietary protein requirement of young Japanese flounder *Paralichthys olivaceus* fed isocaloric diets. *Fisheries Science* 68:158-164.