

Influences of *Sargassum* meal in the diets on growth and body composition of ayu (*Plecoglossus altivelis*) reared in seawater

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Introduction

Ayu (or called sweet fish or sweet smelt), *Plecoglossus altivelis*, is a diadromous fish migrated from freshwater to brackish water to spawn, hatched larvae migrated go to seawater and then back to freshwater to grow. In Asia, it has very high consumers demand due to its good taste and flavor. However, population of this species is currently decreasing because of river pollution, over-fishing and dam construction. Consequently, in order to increase the population resources, it is essential to develop aquaculture techniques such as artificial larval mass production and development of feed for growth. Development of nutritionally well-balanced and cost-effective feed is critical to increase the production of the fish. Studies on nutrient requirement, dietary additive utilization and flesh quality improvement of ayu have been performed (Kanazawa et al., 1982; Lee and Kim, 1999; Lee et al., 2000). Dietary additives affect growth and body composition of fish. Therefore, this study was conducted to investigate the influences of *Sargassum* meal in the diets on growth and body composition of ayu reared in seawater.

Materials and methods

Juvenile ayu were obtained from Uljin Marine Hatchery (Kungbook, Korea). After the conditioning period, fish were weighed and 60 fish (initial mean weight:

4.0 g) were redistributed into each tank. Filtered seawater was supplied at a flow rate of 5 l/min into each tank. During the feeding trial, fish were exposed to natural photoperiod and water temperature was $15.4 \pm 0.93^\circ\text{C}$. Three replicate groups of fish were hand-fed to visual satiety three times daily (7 days a week) at 0800, 1200 and 1700 h for 7 weeks. Three experimental diets were formulated to contain 45% protein 7% lipid. White fish meal, squid liver oil and wheat flour were used as the primary protein, lipid and carbohydrate sources, respectively. Wheat flour in the control diet was replaced with 5% and 10% *Sargassum* meal. One-way ANOVA were applied to determine the significance of measurements. Where significant differences ($P < 0.05$) were found, Duncans multiple range test was used to rank groups using SPSS Version 7.5.

Results and discussion

Survival rates of all groups were above 80%. Weight gain, feed efficiency and protein efficiency ratio were not significantly affected by dietary *Sargassum* meal levels ($P > 0.05$). There were no significant differences ($P > 0.05$) in moisture, crude protein, crude lipid and ash contents of whole body among all diet groups. Fatty acid composition was not affected by dietary *Sargassum* meal levels ($P > 0.05$). It is concluded that *Sargassum* meal can be used as a dietary additive or partial substitutive protein source in this dietary formulation for juvenile ayu reared in seawater.

References

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