Poster:

Growth of tiger grouper (*Epinephelus fuscoguttatus*) juvenile from wild and hatchery at different type of feeds

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Abstract. This study aimed to observe the influence of two sources of juvenile tiger grouper *Epinephelus fuscoguttatus* (Forsskål, 1775) from the sea and the hatchery by several types of food (pellets, tilapia & anchovies). Growing Studies were carried out above 9600 juvenile tiger grouper from two sources namely differing from the sea of 4800 juvenile and 4800 juvenile hatchery from hatching. The design of treament were done by 2x3 with four replications. During the 30 day rearing period, each 5 days is taken sampling total body length (cm) juvenile tiger grouper. The results showed that during the rearing period the value of marine juvenile grouper only high growth in juvenile ate anchovies and tilapia except on day 5 and 30, and could not adapt to the food from the pellet. While in hatchery juvenile tiger grouper had high growth to consume pellets only and could not adapt well to the food of tilapia and except anchovies on day 15th.
Keywords: groupers, wild, growth, juvenile, and pellet.

Introduction

The tiger grouper, *Epinephelus fuscoguttatus* (Forsskål, 1775) is one of the important fishery commodities in Asian countries. It is very popular for seafood, and is cultured intensive and extensively in Malaysia, Indonesia and Hongkong (Teng *et al*1978; Liu & Mitcheson 2008; Sugama *et al* 2008). In Indonesia especially in Aceh Province, extensive and semi intensive aquaculture is commonly practice and trash fish isusually used as feed item for the fishes.

In Aceh, most farmers used pellet for culture groupers as alternative feeding, due to its price is relatively high, considered costly for traditional aquaculture and material additive contended in pellet. Generally farmers used Anchovies (*Stolephorus* spp) and tilapias (*Oreochromis mossambicus* (Peters, 1852)) as alternative feeds to reduce the production cost of grouper. Muhammadar *et al* (2011) reported that average of crude protein content (CP%) of the feeds were EP2^{R} pellet (55.00%), anchovies (52.54%) and tilapia (45.16%) respectively and the velue significance difference ($P < 0.05$). However, high protein is not necessarily guarantee good growth of juvenile Epinephelus fuscoguttatus during the rearing time. This is influenced by several factors such as, the type species, and species comparisons of food size, type of food, digestion and etc. In some case, pellet has additive material from plants that are anti-nutritional growth because there are like protease inhibitors, lectins, saponins and tannins (Agbugui, *et al* 2010), thus cause trouble digesting food. This study aims to observe the influence of two sources of juvenile tiger grouper (wild & hatchery) by some type of food (pellets, tilapia & anchovies).

Materials and Methods

Studies are carried out above 9600 juveniles tiger grouper from two different sources, namely from the sea of 4800 wild juvenile and 4800 juveniles hatchery from hatching results. Juvenile grouper that is used Juvenille has age about 2.5 months from the time of hatching with an average size of 3.8 cm. Pellet otohime EP2® producted by Aquasonic Ltd., are used as food sources for Anchovy (*Stolephorus* spp) and Tilapia *Oreochromis mossambicus*. Both of these fish are trash fish obtained from the surrounding environment.

Each of hapa net (size 1.5 x 1.2 x 1 m) contain 400 juveniles are reared for 30 days. During the test period, wild juvenile are divided into three (3) treatment of feeding pellets namely EP2 ® (LP), Anchovy (LB), and Tilapia (LT), whereas for juvenile from hatchery were given to 3 (three) treatment of the same food source Pellet namely EP2 ® (HP), Anchovy (HB), and Tilapia (HT). Observation of growth in total body length (TL) of fish is done once every 5 days during the rearing time. The Observations of absolut growth is the following formula $AGr = (L2-L1)/ \Delta t$. The data were subjected to two-way analysis of variance (ANOVA), followed by

comparison of means using Duncan's multiple range test to determine significance of each data (Dytham 2003).

Results and Discussion

The results of measurements total body length of juvenile tiger grouper showed (Table 1) that during the 30th-day of rearing, wild juvenile had longer TL with the feeding of tilapia. The total length of wild juvenile on day 5, 15 and 20 with feeding tilapia and Anchovy was not significantly different (P <0.05). The TL source juvenile grouper from hatchery fed pellet during 30 days of rearing was generally better than feeding tilapian and anchovies except on day 15 of the TL value of feeding pellets and anchovies (4.61-5.65 cm) did not give significantly different (P <0.05).

Table 1. Mean ± SD size (cm) for 30-days sampling juvenile on pond rearing. Mean total lengh rate in the same row values followed by a different superscript indicate significant differences (P <0.05).

Treament		Sampling days						
Source of juvenile	Type of food	0	5	10	15	20	25	30
Wild	Pellet (WP)	(3.88 ± 0.021)^{a}	(4.04 ± 0.034) ^{c}	(4.38 ± 0.025) ^{c}	(4.57 ± 0.018) ^{b}	(4.62 ± 0.022)^{d}	(5.12 ± 0.043) ^{d}	(5.39 ± 0.059) ^{d}
	Tilapia (WT)	(3.88± 0.018) ^{a}	(4.23 ± 0.015) ^{a}	(4.59 ± 0.018) ^{a}	(4.63 ± 0.045) ^{a}	(4.76 ± 0.046)^{ab}	(5.41 ± 0.051) ^{a}	(5.90 ± 0.043) ^{a}
	Anchovy (WA)	(3.88± 0.026) ^{a}	(4.22 ± 0.015) ^{a}	(4.42 ± 0.010) ^{b}	(4.63 ± 0.023) ^{a}	(4.72 ± 0.073)^{bc}	(5.31 ± 0.073) ^{b}	(5.73 ± 0.058) ^{b}
Hatchery	Pellet (HP)	(3.88 ± 0.015) ^{a}	(4.27 ± 0.033) ^{a}	(4.57 ± 0.007) ^{a}	(4.65 ± 0.013) ^{a}	(4.81 ± 0.029)^{a}	(5.45 ± 0.031) ^{a}	(5.92 ± 0.038) ^{a}
	Tilapia (HT)	(3.88 ± 0.026) ^{a}	(4.16 ± 0.061) ^{b}	(4.41 ± 0.012) ^{b}	(4.56 ± 0.015) ^{b}	(4.68 ± 0.034) ^{c}	(5.22 ± 0.044) ^{c}	(5.63 ± 0.044) ^{c}
	Anchovy (HA)	(3.88 ± 0.026) ^{a}	(3.99 ± 0.031) ^{d}	(4.37 ± 0.015) ^{b}	(4.61 ± 0.026) ^{a}	(4.68 ± 0.026)^{cd}	(5.17 ± 0.047) ^{cd}	(5.64 ± 0.076) ^{bc}

The growth of juvenile tiger grouper (Epinephelus *fuscoguttatus*) are shown in figure 1. The results showed that the growth of wild juvenile during the 30-day of rearing has the highest feeding value of anchovies, except on day 10th of rearing, the value of growth is higher with feeding than fish Tilapia (0.071 cm). Value growth is not significantly different hatchery juvenille fed pellets (0.068 cm). On the 30th of rearing, the highest growth obtained for wild juvenile with fed tilapia (0067 cm), anchovies (0.067 cm) and hatchery juvenile were fed pellets (0.068 cm) with value growth were not significantly different (p <0.05).

The growth of absolute grouper juvenile for 30 days of within 5 days of observation time is shown at figure 1. At the beginning observation on the fifth day indicated that the treatment of WT, WA, and HP has high rate and not different significantly among the treatment (P < 0.05). On the other hand,the treatment of WP, HT and HA has lower growth and different significanty. (P < 0.05). On the tenth day of the treatment for WP, HT and HA , the rate of the growth was improved but the rate treatment of WT, WA, and HP dominate higher. The different rate of the absolute growth is related to the use of nutrion content from the food which was given to the growth.

Poster:

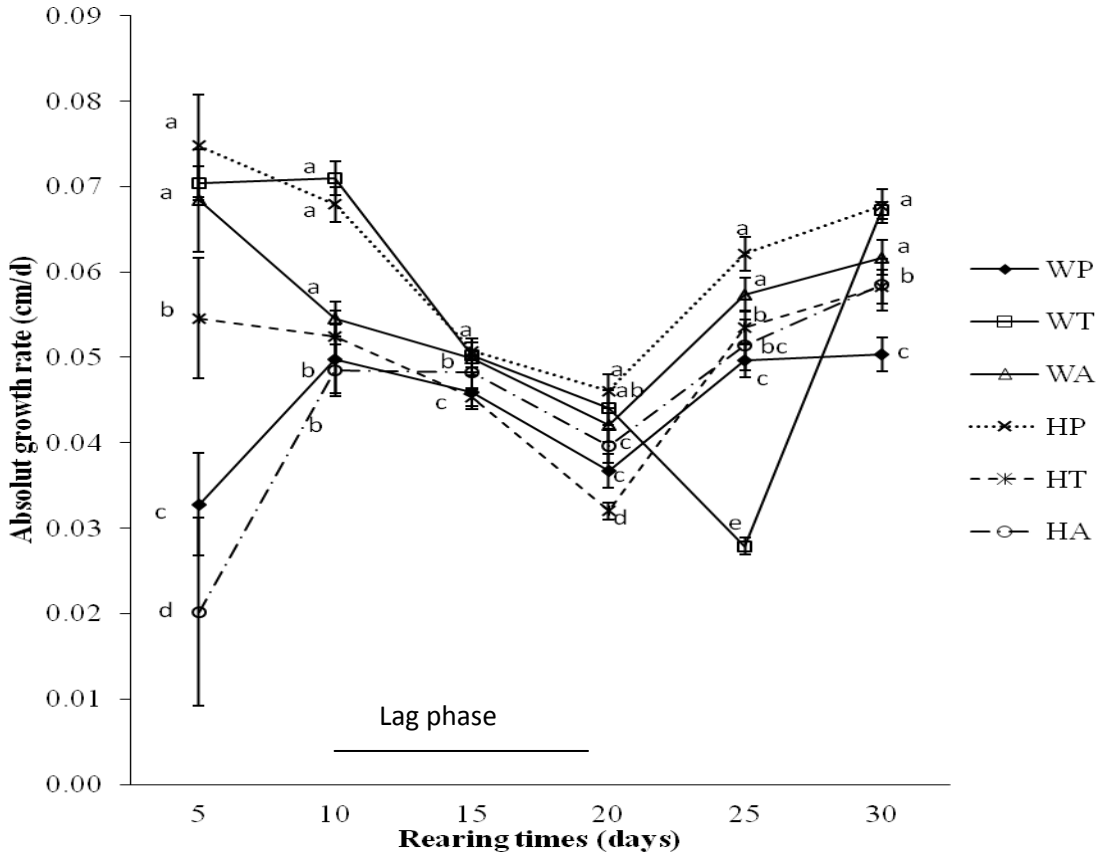

Figure 1. The absulte growth of juvenile tiger grouper during cultivation process

Initially, after 10-20 days of observation, The rate of the absolute growth decreases at all treatment. This such obstacle is commontly called *lag phase*. Howeve, after 20 days of rearing time, the absolute growth of grouper juvenile increase on the thirdy days of rearing in the cake. The growth rate of HP treatment (6.77±0.16) is the highest of all the treatment but not significantly different from WA treatment (6.17±0.22) and WT (6.72±0.13). Those rates are significantly different ($P<0.05$) and lower than WP treatment (5.04±0.18), HA (5.04±0.18), and HT (5.79±0.22). From the beginning to the last observation of the best absolute growth occured at three treatments : WA.WT and HP.

The result of research on several kinds of food (pellet and trash fish) indicated that the average of the absolute growth rate (AGR) at the beginning and last culture has the highest rate on HP, WT, and WA treatment. This indicates that the wild juvenile grouper can not adapt to pellets to get a good AGR, while AGR for juvenil tiger grouper from hatchery can not adapt well to food (trash fish) from anchovy and tilapia. However, the growth of fish will be infuenced by the nutrion quality and food suitability (Labropoulou *et al.* 1998). The obstacles on the absolute growth lag phase occurs in all treatments began to 10-20 days (figure 1) . The observation period occur due to the juvenile grouper at this ager (85-95 day after hatching) The body growth focus on the specific growth (body weight) the body become wider , while the absolute growth absolut growth slowly at temporary time. Wurts dan Stickney, (1993) indicated that during cultivation process of Red Drum Red Drum *Sciaenops ocellatus* with the size of 0-6 g occured at *lag phase*, but at the size of 6-15 g the quick growth occur, and *lag phase* at that time will fasten the growth response at the next time. Althought the food from the pellet has already had the good the nutrion quality, the *lag phase* for the the absolute growth do not change and this fact stated that the ontogony characterisctic for absolute growth still occur during cultivation period and the lag phase can differ and depend on the age and the species. The existence of lag phase at the absolute growth of fish indicated that the increase of weight

toward the fish body, the mofology change involve metabolism activity through a physiology process (Fuiman, 2002).

The facts demonstrated that the wild juvenile grouper could not adapt to the diet of pellets, while the growth in hatchery juvenile tiger grouper could not not adapt well to the food (tras-fish) from the anchovies and tilapia. This is becaused the nature ontogony, habits, feeding behavior and adaptability in nature and which are still carried in the reared period.

Conclusions

Pellet feeding has only appropriate for hatchery juvenile sources. While the food from anchovy and Tilapia sp the growth just available of wild juvenile sources. On days 10-20 of cultivation there is a lag phase

Acknowledgements

This study was supported by the Ministry of Science and Technology and Innovation Malaysia through Universiti Kebangsaan Malaysia (UKM) Science Fund Grant # 04-01-02-SF0124 and UKM Research Grant # UKM-GUP-ASPL-08-04-235, # UKM-FST-2011. The technical assistance provided by the members of Aquaculture Research group of Universiti Kebangsaan Malaysia is acknowledged.

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