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Research Article

Teknik Budidaya Kerapu Cantang (*Ephinephelus fuscoguttatus-lanceolatus*) pada Keramba Jaring Apung di Balai Budidaya Air Payau, Situbondo, Jawa Timur

Culture Techniques of Cantang grouper (*Epinephelus fuscoguttatus-lanceolatus*) at Floating Net Cages in Brackish Water Aquaculture Development Center, Situbondo East Java

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Abstrak

Pelatihan industri telah dilakukan untuk mempelajari dan memahami teknik budidaya dari Kerapu Cantang (*Epiphenelus* sp.). Teknik budidaya kerapu Cantang merupakan salah satu faktor yang akan mempengaruhi tingkat pertumbuhannya. Pengambilan sampel ikan dilakukan selama 21 hari di Pusat Pengembangan Budidaya Perikanan Air Payau, Situbondo, Jawa Timur. Hasil penelitian ini menunjukkan bahwa pertumbuhan kerapu Cantang meningkat signifikan sebesar 2,29 gram/hari. Pengelolaan pakan dan kualitas air yang baik dianggap sebagai faktor utama yang berpengaruh pada pertumbuhan Kerapu Cantang selama proses budidaya

Abstract

An industrial training has been conducted to learn and understand the culture techniques of Cantang grouper (*Epiphenelus* sp.). The culture technique of Cantang grouper is one of the factor that affecting its growth. The fish sampling was carried out for 21 days at Brackish Water Aquaculture Development Center, Situbondo, East Java. The result of this study demonstrated that growth of Cantang grouper was increased significantly of 2.29 gram/day. Good management of feed and water quality are considered as the main factors that gave effect on the growth of Cantang grouper during the cultivation process.

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1. Introduction

Hybridization is cross-breeding between genetically different organisms, good in one species known as intraspecific hybridization and between species as interspecific hybridization. Hybridization has become an effective way to get characteristics desired or improve quality of fish that are cultivated. Deep hybridization aquaculture aims to get fish that has advantages compared both the parent or combination between them, like having a fast growth rate, resistant to disease attack, has tolerance for environmental changes, improve quality of fish meat, and other superior properties. Hybridization can also be used for manipulating the sex ratio and also producing sterile fish (Bartley *et al.*, 2001).

Cantang grouper (*Epinephelus* sp.) is a hybrid species of female Tiger Grouper, *Epinephelus fuscoguttatus* and male Giant Grouper, *Epinephelus lanceolatus*, that conducted by Brackish Water Aquaculture Development Center (BADC), Situbondo since 2009. Cantang grouper is morphologically similar to both parent species, while growth performance is better than the Tigers Grouper or Giant Grouper. In addition, Cantang grouper is more and adaptive and resistant to certain disease (Firdaus *et al.*, 2016). The difference

between Tiger grouper, Cantang grouper and Giant grouper is very prominent. This can be seen from the phenotypic nature and character. One of them is the colour, body size and length of time for growth

The feed management and water quality play an essential role on the growth of the fish including Cantang grouper. Hence, with the good management of feed and optimal water quality, the Cantang grouper may achieve a higher growth performance.

2. Materials and Methods

2.1 Location and Time

This practical has been conducted at floating net cages in Brackish Water Aquaculture Development Center (BADC), Situbondo is located in the province of East Java. Geographically, BADC Situbondo is located at position 7°00'-8°00' S, 113°00'-114°00' E. The time duration of this study is approximately 1 month, which started from 13 August until 12 September 2018.

2.2 Data Collection

Field work practice activities include collecting primary data, active participation and secondary data obtained by:

1. Primary data is the source and research obtained directly from the original source (not through intermediaries). Primary data

Table 1. The equipment and tools needed for culturing the Cantang grouper in floating net cages.

1. Cultivation net	For cultivation and protecting fish so they are not released
2. Scoop net	To catch the fish
3. Bucket	For fish treatment process
4. Basket	For trash fish container
5. Measuring balance	For weighing fish
6. Scissors	To cut trash feed
7. Basin	For filling fish pellets
8. Water Pumper	To wash the net
9. Buoys	To maintain safety
10. Boat	For transportation to KJA
12. Knife	To cut fresh feed
13. Cutting board	For fish cutting process
14. Sinkers	To maintain the net shape
16. Brush	Bo brush the nets
18. Thermometer	To measure water temperature
19. pH meter	To measure acidity
20. Refractometer	To measure water salinity
21. DO meters	To measure dissolved oxygen
22. Ruler	To measure the length fish sample
23. Phone	As a documentation tool

- can be in the form of subject opinions (people) individually or in groups, the results of observations of an object (physical), events or activities and results of testing.
- Active participation is involvement in an activity carried out directly in the field (Nazir, 1998). Active participation was carried out by directly following several activities in the technique of Cantang grouper extraction in BPBAP Situbondo.
 - According to Sangadji and Sopiah (2010) that secondary data is a source of research data obtained indirectly through intermediary media (obtained and recorded by other parties). This data is obtained from documentation data, books, research institutions, fisheries services, reports from the private sector and other parties related to the effort to enlarge Cantang grouper.

these two type feeds given for is 3-7% of the body weight of the fish. Cultivation activities carried out in floating net cage (KJA) BADC Situbondo using combination feed between pellet and trash fish. The way of feed the fish by fish pellet is called as ad satiation, which mean the pellet will not be given anymore when the fish are stop eating and the feeding time usually is in the morning (8.00 a. m. and 10.30 a. m.). The fish pellet and trash fish are given to fish alternately day by day.

2.5 Water Quality Measurement

The enlargement of Cantang grouper in floating net cages (KJA) BADC Situbondo, water quality monitoring is the main step when selecting floating net cage (KJA) locations. Water quality is one of the limiting factors of aquaculture activities, because fish are one of the organisms that are very sensitive to changes in the environment and the

Table 2. Materials needed for culturing the Cantang Grouper in floating net cages.

1. Cantang Grouper Seed	As a seed of the fish that will be raised
2. Fresh feed	As a natural Grouper feed
3. Pellets	As a feed made by crunchy Groupers
4. <i>Acriflavine</i>	As a treatment for fish disease
5. Seawater	As a material for water quality analysis
6. Freshwater	As a treatment for fish disease and feed enrichment used
7. Progol	As an adhesive vitamin
8. Vitamin biovit	As a feed nutritional enhancer

Table 3. The data obtained from water quality sampling in floating net cages.

Water Parameter	Average	(Firdaus <i>et al.</i> , 2016)
Temperature (°C)	27-28.0°C	27.0– 32.0°C
Water transparency (m)	15.0-15.5	>5
pH	8.38-8.46	7.0– 8.5
Dissolve oxygen (mg/l)	4.8-6.0	>4
Salinity (ppt)	32-33	30-34
Ammonia (mg/l)	<0.001	0.3
Nitrite (mg/l)	<0.001	0.06

2.3 Equipment and Materials

2.4 Feed Management

Generally used two types of feed, namely pellets and trash fish. The amount of

environment in which they live is water. Water sampling usually is carried out once a week to ensure the fish are living in an optimal environmental condition.

2.6 Fish Sampling

The fish sampling process is carried out during the process of changing the cultivation nets and 10 days once sampling. The length and weight of the 10 Cantang groupers are measured and recorded to get the average reading

3. Result and Discussion

According to Mardiana *et al.*, (2015), temperature is one of the factors that is very important for the life of organisms in the ocean, because temperature greatly affects both metabolic activity and the development of marine organisms. The average temperature

parameters of the can be used as an indication of water quality. The average result of the measurement of pH values obtained is 8.38, which is a good pH value for marine biota ranging from 7.0-8.5, this indicates that water that the pH value of water in the location of aquaculture in floating net cages is a good pH range for cultivation activities. Horizontal distribution of salinity can be influenced by patterns of water circulation, evaporation, rainfall and river water (Kalangi *et al.*, 2012). the influence of river water makes the variation of salinity in coastal waters greater than the high seas (Hickey *et al.*, 1998). The average result of the

Table 4. The results of length and weight of fish sampling.

Growth parameter	Time			Growth rate
	1 st	2 nd	3 rd	
Average length (cm)	28.0	28.8	29.5	0.07cm/day
Average weight (gram)	302	331	350	2.29g/day

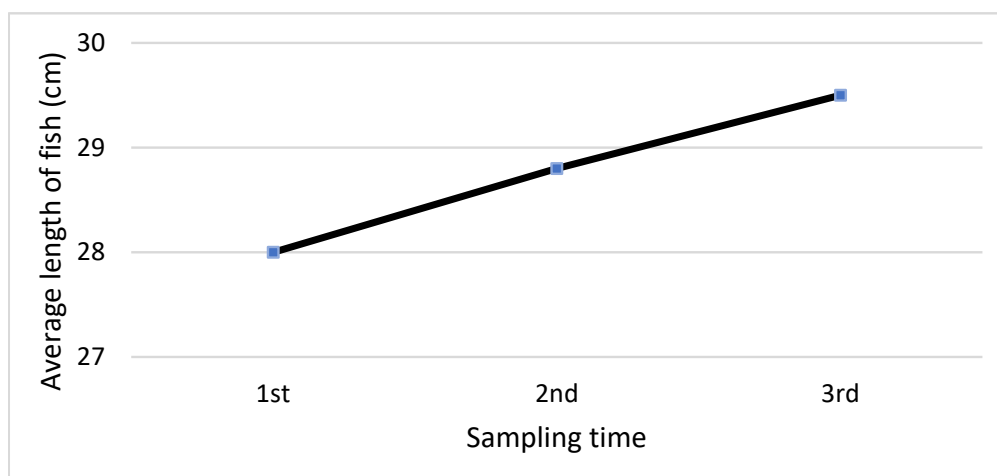


Figure 1. Graphic shows the average length of fish against the sampling time in floating net cages

obtained from sampling is 28°C, this indicates that the water temperature in the waters of KJA BADC Situbondo is the ideal temperature. This is in accordance with the standard of marine biota released by Firdaus *et al.* (2016), namely the optimum temperature for marine biota ranges from 27.0-30.9°C. The degree of acidity (pH) is one of the chemical

salinity samples obtained is 33 ppt. When compared to the standard of marine biota which was released by Firdaus *et al.*, (2016) namely the good salinity for biota the sea ranges from 30-34 ppt, this indicates that the value of water salinity at the cultivation site in floating net cages is a good salinity

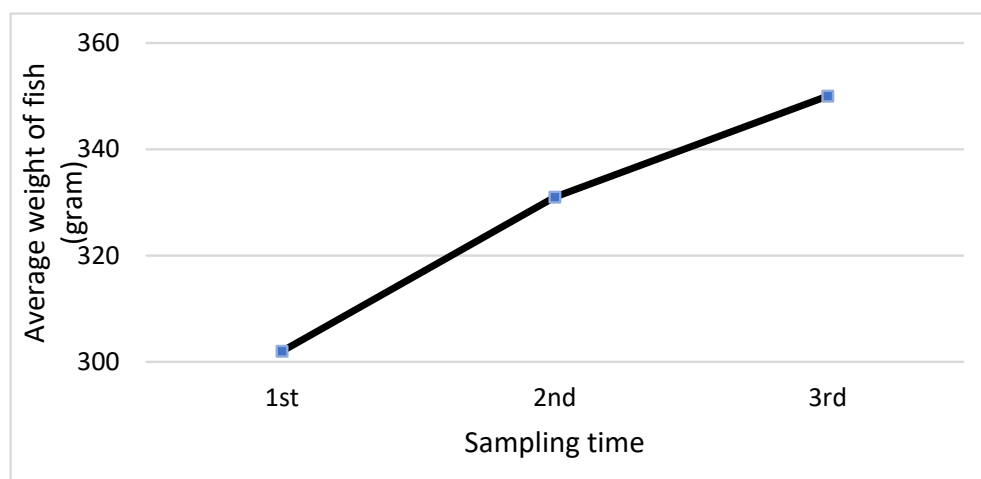


Figure 2. The graph shows the average weight of fish against the sampling time in floating net cages.

value for aquaculture activities. Nitrite and ammonia parameters are part of the speciation of the nitrogen cycle in the waters. It is known that if the presence of oxygen is sufficient in the waters, the presence of nitrates is more dominant or high on the contrary if less oxygen in the waters of nitrite and ammonia compounds will be high in the waters. The sample results obtained showed that the reading of ammonia and nitrate are less than 0.001. If compared with the standard of marine biota released by Firdaus *et al.*, (2016), the limit of ammonia content in waters that are good for marine biota is 0.3 while the limit of nitrite content in the waters that is good for marine biota is 0.06. The waters around floating net cages (KJA) show a figure far below the standard for marine biota which indicates that the waters are included in good water

Fish growth in terms of length and weight is one of the goals of the enlargement of Cantang grouper in floating net cages. According to Langkosono (2006) said that the growth of Groupers without differentiating species per day increased by about 1.76 gram/day. The growth rate of the fish can be calculated by using the final average weight of fish deduct the initial average weight of fish and divided by the time duration. The result obtained from the sampling show the growth rate of the Cantang grouper is 2.29 gram/day. Hence, the result shows the good growth condition of Cantang grouper in KJA, BADC Situbondo, compare to the 1.76 gram/day that

suggested by Langkosono (2006). This can be happened because of proper feed management, good water quality management which encourages the success of growth process that carried out throughout the cultivation process.

4. Conclusion

Based on observations can be concluded that the good water quality and good feed management can give positive growth of Cantang grouper. The higher growth rate of Cantang grouper can be achieved by other factors as well including enrichment of feed management.

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