Effect of Different Baits on Catch of Mangrove Crab

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Abstract

This study aims to determine the effect of different kinds of bait on the catch of mangrove crab (Scylla serrata) in Kwandang District, North Gorontalo Regency. This research was conducted in September 2015 - August 2016. The research method of exferimental fishing was carried out with 3 treatments, namely selar fish bait, chicken head bait and golden snail bait. Experimental data were analyzed by randomized block design (RBD) and Duncan's test. The results showed that different types of bait affect the catch. Chicken head bait is the best bait that gives more catches than the other baits. Duncan's multiple range test results showed that the treatment of chicken head bait was significantly different from the treatment of goldfish and golden snails. Furthermore, the treatment of selar fish bait was significantly different from the treatment of golden snail bait.

Keywords: bait; mangrove crab; Scylla serrata; catch.

Introduction

Mangrove crab (Scylla serrata) is one of the fisheries resources in the coastal area that has high economic value because it is very popular with the community and is one of the important fishery commodities in the Indo-Pacific region. This animal has meat and eggs with high protein content (Delman, 1972 in Rosmaniar, 2008).

In Indonesia, mangrove crabs have been an important fishery commodity since the early 1980s. Mangrove crab fisheries in Indonesia are obtained from capturing natural stocks in coastal waters, especially in mangrove or estuary areas, and from aquaculture in brackish water ponds. Lately, with the increasing economic value of crab fisheries, mangrove crab fishing has also increased (Cholik 1999 in Wijaya, 2011). This is very necessary in order to develop a more effective and efficient fishing effort without neglecting the preservation of resources and the environment (Almada, 2001)

Kwandang District has considerable potential in developing mangrove crab production in North Gorontalo District. The amount of mangrove crab production began to increase, in 2010 it reached 12,913 tons / year with an average price of Rp.56,000 / kg while in 2011 it reached 14,594 tons / year with an average price of Rp.60,000 / kg. Therefore, increasing the production of mangrove crabs is prioritized so that North Gorontalo Regency can become the largest crab production and will also benefit the region itself (DKP North Gorontalo Regency, 2012).

Efforts to increase the production of mangrove crabs can be done through operations to capture mangrove crabs in the wild. Bait is an important factor to support the success of fishing activities. The bait used must be able to stimulate the crab's olfactory organs and be durable when immersed in water. In the process of catching mangrove crabs, fishermen in Kwandang District usually use fish as bait. Muchlisin and Azwir's (2004) research results concluded that the use of chicken heads as bait will get a better catch than the skin of cows, fish and coconut cake. This shows that the use of different types of bait allows differences in the number of catches. Based on this, then research on the effect of different types of bait on the catch of mangrove crabs needs to be done.

This study aims to determine the effect of different types of bait on the catch of mangrove crabs in Kwandang District, North Gorontalo Regency.

Research Methodology

This research was conducted in September 2015 - August 2016, located in Kwandang District, North Gorontalo Regency, Gorontalo Province.

The data collection in this study was carried out by using the method of experimental fishing, which is conducting operational activities of catching mangrove crabs directly in the pond area by using 9 units of fishing gear and 3 types of bait consisting of fishes, chicken heads and golden snails. The study was conducted for 7 days with data collection divided into 3 time groups in a day namely: the first time (I) starts from 00.00 - 05.00 WITA, the second time (II) starts from 06.00 - 11.00 WITA and the third time (III) starts from 16.00 - 21.00 WITA.

This research activity is divided into several stages. Preparation stage: Before carrying out fishing activities first prepare fishing gear and bait as well as all other needs that become needs during the activities carried out. After preparation is complete, then depart to the fishing ground (fishing ground) that has been determined based on the experience of fishermen and adapted to the natural habitat of mangrove crabs.

Installing a fishing gear (setting): The setting of the fishing gear (setting) is done after being in the location that is the destination of the arrest operation. At the fishing location 9 units of rakkang fishing gear were installed, each type of bait consisting of 3 fishing lines. The bait is placed in the middle of the rakkang net by fastening it to one of the mesh nets. After completing the bait installation, the setting process is carried out by lowering all the fishing gear to the bottom of the water. The placement of fishing gear is done randomly with a distance of 1 meter each and tied to the tip of a 3 meter wood that is embedded in the water's edge, then let it soak in the water.

Lifting fishing gear (hauling): Checking fishing gear is carried out every 30 minutes. The length of time is determined based on the experience and habits of local fishermen in operating the barge on the grounds that the longer the bark is in the water it is often found that the bait has run out and the crab is gone. This is caused by the construction of fishing gear that does not have an effective trap system, with a large net mouth making it easy for crabs to escape. The crabs caught are counted and measured in length and weighed, then the next setting is done.

The number of crabs caught is counted, then the length or width of the carapace is measured using a meter and the weight is measured using a scale, then the mangrove crab is placed in the cool box and separated according to the bait used.

Data obtained from the results of the experiment will be analyzed using a Randomized Block Design (RCBD). The mathematical formula of this design is as in Hanafiah (2011).

If the results of the analysis show a significantly different effect between each treatment then a further test is used, Duncan's multiple range test to determine the differences between treatments. Duncan's Multiple Range Test. Mathematical formula is as in Sudrajat and Achyar (2010).

The hypothesis to be tested in this study are:

H0: The use of different types of bait does not affect the number of catches of mangrove crabs.

H1: The use of different types of bait affect the number of catches of mangrove crabs.

Results and Discussion

Operation of the rakkang

This fishing gear generally use a frame made of bamboo, although some are using iron as a frame. The net material used generally uses pieces of used nets therefore there are no specific specifications to make them. Pieces of nets that are usually used are pieces from scrapped gill nets.

The construction of the rakkang traps used in this study are those commonly used by local fishermen. One rakkang unit consists of a 4 frames and 4 supporting poles made of bamboo with a diameter of 3.5 cm and a length of 50 cm, respectively. The net used is a used gill net with a mesh size of 2 x 2 cm.

Rakkang fishing gear operations are carried out first by installing bait tied to one of the mesh nets then the rakkang is tied to a 3 meter wood then lowered to the bottom of the water and the hardwood stick is stuck to the water's edge, the rakkang are left in the water for 30 minutes then lifted to collect the catch. This duration is determined based on the experience and habits of the local fishermen. This time is considered ideal because if too long the rakkang is in the water it is often found that the bait has run out and

the crab is gone. This is caused by a large net mouth making it easy for crabs to escape. This fishing gear construction does not have an effective trap system. This fishing gear is classified as a fishing gear that is simple and economical and easy to operate.

Catch

The overall catch of mangrove crabs during the study can be seen in Table 1.

Tabel 1 Overall catch of mangrove crabs

Treatment	Time Groups																					Total Cath	Average
	Day 1			Day 2			Day 3			Day 4			Day 5			Day 6			Day 7				
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		
Fish	0	1	2	1	1	1	0	0	2	1	0	2	0	1	1	0	1	2	0	2	2	20	2.86
Chicken's head	1	1	2	1	2	3	0	2	3	0	1	4	1	2	3	0	3	3	1	2	2	37	5.29
Golden Snail	1	0	1	1	0	0	0	0	1	0	1	1	1	0	0	0	1	1	0	1	2	12	1.71

The catch of mangrove crabs during the study was 69 crabs with the bait of chicken head getting the most catches of 37, the selar fish bait getting 20 catches and the golden snail bait getting 12 catches.

The number of catches of mangrove crabs with selar fish bait is 20 tails, with a long range of 5.3 - 13.7 cm and average length (carapace width) 8.87. The total weight of the catch is 3300 grams and the average weight is 165 grams.

The number of catches of mangrove crabs (Scylla serrata) with chicken head bait is 37, with a long range of 5.4 - 14.8 cm and an average length (carapace width) of 9.06. The total weight of the catch is 5,121 grams and the average weight is 138 grams.

The number of catches of mangrove crabs (Scylla serrata) with golden snail bait is 12 tails, with a 5.5 to 11.6 cm long range and an average length (carapace width) of 8.65. The total weight of the catch is 1,597 grams and the average weight is 133 grams.

Data Analysis

Tabel 2 Analysis of variance (ANOVA)

SK	DB	JK	KT	F-calc	F-table	
					5%	1%
Group	6	3.59	0.60	1.18^{ns}	3.00	4.82
Treatment	2	46.58	23.29	45.67**	3.88	6.93
Error	12	6.12	0.51			
Total	20	56.29				

Remarks: * = Real; ** = Very real; ns = Non-significant

Based on Table 2 it can be seen that the value of F-count = 45.67 is greater than the F-table at the level of 1% and the level of 5%, so it was decided to reject H0 and accept H1, which means the effect of the difference in treatment is said to be very real (F-count is marked with a sign **).

Based on Duncan's multiple range test results obtained that the best treatment is chicken head bait

(B) which is very significantly different from the selar fish bait (A) and golden snail bait (C). Furthermore, the selar fish bait is significantly different from the golden snail (C) and not significantly different from the chicken head (B). Golden snail bait (C) is not significantly different from chicken head bait and fish bait.

Duncan test results based on 7 replications can be seen in Table 3.

Tabel 3 Results of Duncan Test

Treatment	Average	P	
		2	3
C. Gold. Snail	1,71	-	
A. Selar Fish	2,86	1,15*	-
B. Chick's head	5,29	2,43**	3,58**
SSR and LSR		P	
		2	3
SSR	0.05	3.08	3.23
	0.01	4.32	4.55
LSR	0.05	0.92	0.97
	0.01	1.30	1.37

Effect of different types of bait on the catch of mangrove crabs

According to Monintja and Martasuganda (1991) in Adlina et al., (2014) that the entrapment of shrimp, crabs or demmersal fishes caused by several factors, one of which is caused by the smell of bait. The bait used must meet the requirements to stimulate the fish's sense of smell and taste. Smells dissolved in water can stimulate receptors in the olfactory organs which are part of the fish's sense of smell or crab type.

It is known that the type of chicken head bait is the best bait in this study by getting the most catches. This is because the chicken's head has a sharper aroma compared to other bait so that the crab is caught more in this bait. Syandri (1998) in Adlina et al., (2014) states that the olfactory reaction of fish is caused by the presence of a water-soluble odor. Stoner (2004) in Putri (2013) said that the crab is a type that is active at night (nocturnal), in which three ways of searching for food are more dominant using the olfactory organ than the organ of sight.

Putri (2013) explained that the crab can detect the presence of the bait due to the chemical content of the bait that is carried by the current to its place. One of the chemical contents in the bait is amino acids which are stimuli that can be detected by predatory fish that eat non-living food (bait).

Conclusion

Based on the results of the study it can be concluded that the initial hypothesis H0 is rejected and the hypothesis H1 is accepted that the use of different types of bait affect the amount of catch of mangrove crabs (Scylla serrata).

The bait that gets the most catches is the chicken head bait, then the selar fish bait and the least is the golden snail bait.

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