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DIFFERENCES IN MUD CRAB (*Scylla* spp.) CATCHES USING DIFFERENT BAIT ON BUBU FISHING GEAR IN LAMBUR LUAR VILLAGE JAMBI PROVINCE

Perbedaan Hasil Tangkapan Kepiting Bakau (*Scylla* spp.) dengan Menggunakan Umpan yang Berbeda pada Alat Tangkap Bubu di Desa Lambur Luar Provinsi Jambi

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ABSTRACT

The mud crab (*Scylla spp.*) is a fishery resource of high economic value and plays an important role in maintaining the balance of mangrove ecosystems. In Lambur Luar Village, Muara Sabak Timur District, mud crab fishing activities generally use *bubu* traps with various types of bait. However, the effectiveness of each bait type on catch performance has not been clearly determined. Therefore, this study aimed to examine the effect of different bait types on the catch performance of mud crabs and to identify the bait type most preferred by *Scylla spp.* The research was conducted from February to March 2025 in the mangrove waters of the Lambur Kecil River, Lambur Luar Village, using the experimental fishing method with three treatments: mudskipper fish bait (P1), chicken head bait (P2), and sea eel bait (P3), each repeated 16 times. The data collected included the number of crabs caught, total weight, carapace length, and carapace width, which were analyzed using ANOVA followed by Duncan's multiple range test. The results showed that bait type had a highly significant effect on the catch performance of mud crabs. The chicken head bait (P2) produced the highest number and weight of catches, with an average weight of 407.7 g, carapace length of 10.6 cm, and carapace width of 12.6 cm. The mudskipper fish bait (P1) ranked second, while the sea eel bait (P3) yielded the lowest catch. It can be concluded that chicken head bait is the most effective bait for increasing mud crab catches using *bubu* traps in the waters of Lambur Luar Village, Muara Sabak Timur District.

Key words: Mud crab (*Scylla* spp.), bait, *bubu* trap, catch performance, Lambur Luar Village

ABSTRAK

Sumberdaya kepiting bakau (*Scylla* spp) memiliki nilai ekonomi tinggi serta berperan penting dalam menjaga keseimbangan ekosistem mangrove. di Desa Lambur Luar, Kecamatan Muara Sabak Timur, kegiatan penangkapan kepiting bakau umumnya menggunakan alat tangkap bubu dengan berbagai jenis umpan. Namun demikian, efektivitas masing-masing jenis umpan

terhadap hasil tangkapan belum diketahui secara pasti. Oleh karena itu, penelitian ini bertujuan untuk mengetahui pengaruh perbedaan jenis umpan terhadap hasil tangkapan kepiting bakau serta menentukan jenis umpan yang paling disukai oleh kepiting bakau (*Scylla spp*) Penelitian ini dilaksanakan dari bulan Februari - Maret 2025 di Desa Lambur Luar di perairan mangrove Sungai Lambur Kecil menggunakan metode *eksperimental fishing* dengan tiga perlakuan, yaitu umpan ikan tembakul (P1), kepala ayam (P2), dan belut laut (P3), masing-masing jenis umpan diulang sebanyak 16 kali. Data yang dikumpulkan meliputi jumlah tangkapan, berat total, panjang karapas, dan lebar karapas, yang selanjutnya dianalisis menggunakan ANOVA dan uji lanjut Duncan. Hasil penelitian menunjukkan bahwa jenis umpan memberikan pengaruh yang sangat nyata terhadap hasil tangkapan kepiting bakau. Umpan kepala ayam (P2) menghasilkan jumlah dan berat tangkapan tertinggi dengan berat rata-rata 407,7 gram, panjang karapas 10,6 cm, dan lebar karapas 12,6 cm. Umpan ikan tembakul (P1) berada pada urutan kedua, sedangkan umpan belut laut (P3) menghasilkan tangkapan terendah. Dapat disimpulkan bahwa kepala ayam merupakan jenis umpan yang paling efektif untuk meningkatkan hasil tangkapan kepiting bakau menggunakan alat tangkap bubu di perairan Desa Lambur Luar, Kecamatan Muara Sabak Timur.

Kata Kunci: Kepiting bakau (*Scylla* spp.), umpan, alat tangkap bubu, hasil tangkapan, Desa Lambur Luar.

INTRODUCTION

Tanjung Jabung Timur Regency is an administrative region in Jambi Province located in the eastern part and directly adjacent to the South China Sea. To the south, the regency borders South Sumatra Province and Muaro Jambi Regency, while to the west it borders Tanjung Jabung Barat Regency and Muaro Jambi Regency. Geographically, Tanjung Jabung Timur is the easternmost regency in Jambi Province and is the result of the division of Tanjung Jabung Regency. Its coastal area has a coastline of approximately 191 km² stretching from the border of Tanjung Jabung Barat Regency to the territory of South Sumatra Province. This regency has considerable potential for fishery resources, including sea waters, swamps, and tidal areas with a marine water area reaching 77,752 hectares. Based on data from the Tanjung Jabung Timur Regency Fisheries Service in 2020, capture fisheries production in the marine area reached 23,491.54 tons, while the catch from public waters was 130.86 tons. Furthermore, the aquaculture sector also contributed 120.4 tons (Central Statistics Agency, Tanjung Jabung Timur Regency, 2018). One of the centers of fishing activity in this region is Lambur Luar Village, Muara Sabak Timur District. The fishing community in this village utilizes various fishing gear such as trawls, cast nets, gill nets, and fish traps. Lambur Luar Village is located in a coastal area surrounded by an extensive mangrove ecosystem, which serves as a natural habitat for various aquatic biota, including mangrove crabs (*Scylla* spp.).

Mangrove crabs (*Scylla* spp.) are a fishery commodity with high economic value and increasing demand in both domestic and international markets. According to the FAO (2018), global crustacean production reached 7.9 million tons in 2016. In Indonesia, mangrove crabs are still largely caught wild, particularly in mangrove and estuary areas, with a small portion cultivated in small-scale brackish water ponds. The increasing demand for mangrove crabs has also led to an increase in fishing intensity (Wijaya *et al.,,* 2011). Mangrove crabs are known for their high protein content, approximately 37% (Aslamyah & Fujaya, 2010), and their delicious taste, making them a popular choice. According to Watanabe *et al.,* (2000), mangrove crabs are an important fishery resource found in mangrove areas and brackish waters, with a widespread distribution in the Indo-Pacific region.

Crab fishing is typically carried out using fish traps. This tool is widely chosen by fishermen due to its simple design, affordable manufacturing costs, and ease of operation,

even in small boats. This fishing gear comes in various shapes, such as folding, cage, cylindrical, drum, and semicircular. It is operated in shallow waters to catch bottom fish, shrimp, and crabs. One advantage of fish traps is the relatively fresh catch because the trapped crabs experience little resistance, minimizing the risk of bodily damage and mortality (Ndiba & Lumpe, 2024).

Bait plays a crucial role in successful crab fishing. Effective bait must stimulate the crab's sense of smell, attracting it to the fishing gear (Susanto *et al.,,* 2014). The attractiveness of aromas, particularly from fresh fish or artificial baits that persist in the water, is a key factor. Furthermore, the availability and price of bait materials must also be considered to maintain the efficiency and sustainability of fishing efforts (Arifin & Prasetyo, 2020). The types of bait used by fishermen vary and yield varying catches. Research by Muhammad *et al.,* (2020) showed that chicken head bait yielded the highest catch, followed by scad, while golden snails yielded the lowest catch. Meanwhile, Sa'adah (2024) reported that mudskippers (tembakul) were the preferred bait for mudskippers. This is thought to be related to the strong aromas produced by chicken head and mudskippers, which attract crabs. Fishermen in Lambur Luar Village generally use bait such as stingrays, malung fish, and sea eels. However, the availability of stingrays and malung fish is increasingly limited and relatively expensive, thus constraining fishing activities. Efforts to increase mangrove crab catches can be achieved by operating traps with effective bait (Barbi de Souza & Pinheiro, 2021). This study used three different types of bait: mudskipper, sea eel, and chicken head. The choice of sea eel bait was based on local fishermen's habits, while the use of mudskipper was based on research by Sa'adah (2024), which demonstrated a high preference for mangrove crabs. Chicken head was chosen because research by Muhammad *et al.,* (2020) showed that this bait is the most preferred bait by crabs and is readily available at a low price. Therefore, an alternative bait is needed that is economical, readily available, yet still effective in attracting mangrove crabs. Therefore, this study was conducted to compare the effectiveness of several types of bait to determine the most optimal bait for increasing mangrove crab catches and supporting sustainable fishermen's income.

RESEARCH METHODS

This research was conducted from February to April 2025, which was carried out precisely in Lambur Luar Village, Muara Sabak Timur District, Tanjung Jabung Timur Regency, Jambi Province. The tools used in the research process were; stationery used to record field data; Cameras functioned in research documentation; Bubu operated as a mangrove crab catching tool; Digital scales measured the weight of the catch; Ruler/meter functioned to measure the length and width of the carapace; Knife/scissors cut the bait as needed; Rope as a marker for bait treatment and; Laptop used for data analysis The experimental design used was a completely randomized design (CRD) with 3 bait treatments each using 39 bubu with each treatment 13 bubu units. In addition, 16 repetitions were carried out. The following treatments were analyzed (Muhammad et al, 2018):

P1 = Mudskipper bait
P2 = Chicken head bait
P3 = Sea eel bait

The form of the additive linear model of a completely randomized design (Muhammad *et al.,* 2014) is as follows: $Yij\ i\ i\ ij = \mu + \tau + \varepsilon$

Information:

I : 1,2,…,t and j =1, 2,…,r
Yij : observation of the i-th treatment and j-th replication
μ : general average

i τ : the effect of treatment i
ij ε : random effects on p

If the analysis results show a significant difference in the effects between treatments, the data obtained are tested for normality using the SPSS version 26 application. Next, the data on the number, weight, width, and length of the observed crabs are analyzed statistically using one-way ANOVA. This analysis aims to determine the differences in the effects of the three types of bait on mangrove crabs. Analysis of Variance (ANOVA) is used if there is a significant difference in the effect between treatments, then the Duncan test is performed to determine which bait is most effective. The data obtained are then analyzed using a one-way ANOVA test using the SPSS version 26 application. One-way ANOVA is used to analyze differences between one dependent variable. The ANOVA test is used to find differences or similarities between several means. After the ANOVA test was conducted and it was found that the bait type treatment had a significant effect on the catch parameters (number, weight, length, and width of crabs), further testing was carried out using the Duncan Multiple Range Test (DMRT) or Duncan test, to determine which treatments were significantly different from each other (Desiani *et al.,* 2020)

RESULT

Types of Mud Crab Catch Species (*Scylla* spp.)

The catch obtained is part of the research data conducted at the study site. Based on morphological observations of mangrove crab samples at the study site, only three species of crabs from the genus *Scylla* were found: *Scylla* serrata, *Scylla* tranquebarica, and *Scylla* olivacea. Each species has distinctive morphological characteristics that can be distinguished by body color, carapace pattern, anterior serration shape, the presence of spines on the finger joints, and the distribution of hairs (setae) on the carapace. The following is a morphological description of the crabs obtained during the study:

Table 1. Morphology of Mangrove Crab Types

Types of crabs	Morphological characteristics of crabs				
	Body color	Carapace shape	Serrated shape	Claw shape	Hair/seta
Scylla serrata	Hair/seta	Wide and smooth	Sharp front teeth	Large and symmetrical	Spread widely on the surface of the carapace.
Scylla tranquebarica	Green resembling olives	Rounded with a smooth surface	The front teeth look blunt	Slightly smaller than *Scylla* serrata, symmetrical	Little or almost none
Scylla olivacea	Reddish brown	Narrow and rough	Small, blunt teeth	Small and less symmetrical claws	Lots of hair on the claws and feet

A B C

Figure 1. Differences between types of mangrove crabs (a) *Scylla* serrata (b) *Scylla* tranquebarica and (c) *Scylla* olivacea

Number and Weight of Mud Crab (*Scylla* spp.) Catch

The overall results of mangrove crabs (*Scylla* spp.) during the study can be seen in Table 2.

Table 2. Number of Tails and Weight of Crabs

Repeat (setting to-)	Type of bait					
	mudskipper		Chicken head		Sea eel	
	Number (Tail)	Weight (grams)	Number (Tail)	Weight (grams)	Number (Tail)	Weight (grams)
1	1	380	2	1000	-	-
2	2	820	2	821	1	380
3	1	480	3	1361	1	485
4	2	1105	4	1585	1	230
5	3	1500	5	1450	2	725
6	2	504	5	2045	-	-
7	2	795	2	1015	2	535
8	2	850	3	1240	1	545
9	1	550	2	545	1	575
10	2	865	4	1670	1	230
11	1	312	5	2080	-	-
12	2	585	4	155	-	-
13	2	420	5	2225	2	355
14	1	310	3	1280	1	172
15	1	150	4	1655	-	-
16	2	505	2	560	1	152
Amount	27	10131	55	20687	14	4384
Average/tail	1,69	375,4	3,44	407,7	1,27	313,1

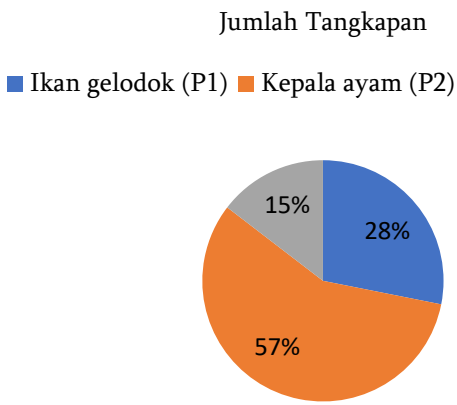

Figure 2 Number of Mangrove Crab Catches (*Scylla* spp.)

The pie chart shows the percentage of mud crab (*Scylla* spp.) catches based on the type of bait used. Chicken head bait (P2) produced the highest catch, at 57% of the total. Mudskipper bait (P1) came in second with a catch percentage of 28%, while sea eel bait (P3) produced the lowest catch, at only 15%. This indicates that chicken head bait is the most effective bait for attracting mud crabs compared to other bait types.

Data Analysis Results

Table 3. ANOVA Analysis of Variance Number of Crab Tails

Anova					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	54.875	2	27.438	35.151	.000
Within Groups	35.125	45	.781		
Total	90.000	47			

Table 4. Duncan Test Results Number of Crabs

Duncan[a]				
		Subset for alpha = 0.05		
Treatment	N	1	2	3
P3	16	.8750[c]		
P1	16		1.6875[b]	
P2	16			3.4375[a]
Sig.		1.000	1.000	1.000

Table 5. ANOVA Analysis of Variance of Crab Weight

Anova					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8546769.875	2	4273384.938	24.414	.000
Within Groups	7876623.375	45	175036.075		
Total	16423393.250	47			

Table 6. Duncan Test Results for Crab Weight

Duncan[a]				
		Subset for alpha = 0.05		
Treatment	N	1	2	3
P3	16	274.0000[c]		
P1	16		633.1875[b]	
P2	16			1292.9375[a]
Sig.		1.000	1.000	1.000

Length and Width of Mud Crab (*Scylla* spp.) Catch

Table 7. Crab Length and Width

Repeat (setting to-)	Type of bait					
	mudskipper		Chicken head		Sea eel	
	Length (cm)	Wide (cm)	Length (cm)	Wide (cm)	Length (cm)	Wide (cm)
1	9,5	13,5	22	28,4	-	-
2	19,8	16,5	19,9	26,8	9,5	12
3	10,5	14,2	29,4	39,8	9,9	14,2
4	29,2	31,8	42	53,1	9,1	10,2
5	40,8	44,9	44,9	58,5	18,6	25,7
6	16,8	22,1	64,7	69,9	-	-
7	19,8	23,1	24,9	28,7	15	16,2
8	23,8	28,1	28,3	35,3	16,2	20,7
9	15,1	16	21,6	23,7	14,2	15,7
10	19,5	25,5	46,1	51	8,3	9,7
11	7,5	9	52	64,7	-	-
12	14,9	17,2	37,5	45,6	-	-
13	11,4	12,6	57,5	63,1	12	12,9
14	7,3	8,8	31,5	39,9	4,7	5,1
15	4,3	5,6	39,9	40,5	-	-
16	13,6	15,7	-	17	4,4	4,7
Amount	263,8	304,6	577,4	686	121,9	147,1
Average/tail	9,7	11,6	10,6	12,6	8,4	10,4

Data Analysis Results

Table 8. ANOVA Analysis of Variance of Crab Length

Anova					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	442317.167	2	221158.583	14.333	.000
Within Groups	694353.500	45	15430.078		
Total	1136670.667	47			

Table 9. Duncan Test Results for Crab Length

Duncan[a]				
		Subset for alpha = 0.05		
Treatment	N	1	2	3
P3	16	61.0000[c]		
P1	16		164.8750[b]	
P2	16			295.6250[a]
Sig.		1.000	1.000	1.000

Table 10. ANOVA Analysis of Variance of Crab Width

Anova					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	786110.792	2	393055.396	19.620	.000
Within Groups	901523.875	45	20033.864		
Total	1687634.667	47			

Table 11. Duncan Test Results for Crab Width

Duncan[a]			
		Subset for alpha = 0.05	
Treatment	N	1	2
P3	16	85.1875[b]	
P1	16	176.3125[b]	
P2	16		390.5000[a]
Sig.		.075	1.000

DISCUSSION

This study used three types of bait, namely mudskipper (P1), chicken head (P2), and sea eel (P3), each with 16 replications. The results showed that chicken head (P2) produced the highest catch, namely 55 mudskippers (*Scylla* spp) with a total weight of 20,687 grams (an average of 3.44 per replication and 407.7 grams per eel). This treatment consistently produced higher yields than other treatments, presumably because the aroma and texture of the chicken head were more attractive to the crabs. This finding is in line with Muhammad *et al.,* (2018) who stated that chicken head is a bait that is very popular with mudskippers, even more effective than trevally and golden snails. The use of mudskipper (P1) produced 27 mudskippers with a total weight of 10,131 grams (an average of 1.69 per replication and 375.4 grams per eel). Although lower than P2, these results are still moderate and align with Sa'adah (2024), who stated that crabs prefer the strong aroma of mudskippers. Meanwhile, sea eels (P3) yielded the lowest catch, with 14 individuals weighing a total of 4,384 grams (an average of 1.27 individuals per replication and 313.1 grams per individual). The low effectiveness of sea eels is thought to be due to an unattractive aroma or texture that does not suit crab preferences (Supadminingsih *et al.,,* 2015). This finding is supported by Lisna *et al.,* (2022), who reported that crabs prefer salted eels due to their stronger aroma.

Overall, 96 crabs were caught across all treatments. These results indicate that bait type influences the number and weight of catches, with chicken heads proving to be the most effective (Adlina *et al.,,* 2014). ANOVA analysis showed a significant effect of bait type on the number and weight of catches ($p < 0.05$). Duncan's test showed that the highest catch was obtained at P2 (3.43 individuals), followed by P1 (1.68 individuals), and the lowest at P3

(0.87 individuals). In terms of weight, the lowest result was at P3 (274 g), the medium result was at P2 (633.19 g), and the highest was at P1 (1292.94 g).

Based on morphometric measurements, the highest average crab length was obtained at P2 (10.6 cm; width 12.6 cm), followed by P1 (9.7 cm; width 11.6 cm), while P3 produced the lowest size (8.4 cm; width 10.4 cm). Total length and width were also highest at P2 (577.4 cm; 686 cm) and lowest at P3 (121.9 cm; 147.1 cm). ANOVA results showed that bait type significantly influenced crab carapace length and width ($p < 0.05$). Duncan's test showed that P2 produced the highest average length (295.63 cm), followed by P1 (164.88 cm), and P3 (61.00 cm), with each treatment being in a different subset. In terms of width, P2 produced the highest result (390.50 mm) and was significantly different from P1 (176.31 mm) and P3 (85.19 mm) which were in the same subset. Thus, chicken head (P2) proved to be the most effective bait, as it increased the number of catches.

CONCLUSION

Research conducted in Lambur Luar Village showed that the type of bait significantly affected the catch of mangrove crabs (*Scylla* spp.) using traps. Chicken head bait produced the best results with the highest number of catches, namely 55 individuals weighing 407.7 grams, an average carapace length of 10.6 cm, and a carapace width of 12.6 cm. Mudskipper bait came in second with 27 individuals, weighing 375.4 grams, a carapace length of 9.7 cm, and a width of 11.6 cm. Sea eel bait produced the least catch, namely 14 individuals weighing 313.1 grams, a length of 8.4 cm, and a width of 10.4 cm. The results of the ANOVA analysis and Duncan's test showed significant differences between the types of bait. The types of crabs caught included *Scylla* serrata, *Scylla* tranquebarica, and *Scylla* olivacea.

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