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The Effect of Using Different Bait on the Catch of Mangrove Crabs (*Scylla* sp) on Bubu Payung Fishing Equipment in Sapat Village, Indragiri Hilir Regency, Riau, Indonesia

Pengaruh Penggunaan Umpan yang Berbeda terhadap Hasil Tangkapan Kepiting Bakau (Scylla sp) pada Alat Tangkap Bubu Payung di Desa Sapat Kabupaten Indragiri Hilir, Riau, Indonesia

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Abstract

Bubu is a passive fishing tool that works by trapping. Over time, a modification known as the bubu payung emerged, which is easy to obtain at an affordable price. This research was conducted in November 2023 over ten days in the waters of the Parit 18 River in Sapat Village, Kuala Indragiri District, Indragiri Hilir Regency. The method used in this research was experimental fishing, employing three types of bait: malong, coconut cake, and coconut pulp. Data analysis was performed using the t-test with SPSS 27.0.1. The results showed no significant difference in the catch of malong bait, coconut cake, or coconut dregs. According to the calculations, bait comparison A t-value (malong bait and coconut cake) (0,294) < t-table (2,306), bait comparison B (malong bait and coconut dregs) t-value (0,385) <t-table (2,306), and bait comparison C (coconut cake bait and coconut dregs bait) t-value (0,081) <t-table (2,306). Therefore, bubu payung can effectively catch mangrove crabs and bycatch.

Keywords: Bubu payung, Bait, Mangrove crabs, Sapat Village

Abstrak

Bubu merupakan alat tangkap pasif yang bersifat menjebak. Dengan perubahan zaman, mucul modifikasi bubu payung yang mudah didapat dan harga terjangkau. Penelitian ini dilakukan pada bulan November 2023 selama 10 hari di perairan Sungai Parit 18 di Desa Sapat Kecamatan Kuala Indragiri Kabupaten Indragiri Hilir. Metode yang digunakan pada penelitian ini adalah dengan menggunakan metode *eksperimental fishing,* dengan menggunakan tiga jenis umpan: ikan malong, bungkil kelapa dan ampas kelapa Analisis data menggunakan uji t dengan SPSS 27.0.1. Hasil penelitian ini menunjukkan bahwa tidak ada perbedaan nyata terhadap hasil tangkapan umpan ikan malong, bungkil kelapa dan ampas kelapa. Berdasarkan hasil perhitungan perbandingan umpan A (umpan ikan malong dan bungkil kelapa) t-hitung (0,294) < t-tabel (2,306), perbandingan umpan B (umpan ikan malong dan ampas kelapa) t-hitung (0,385)<t-tabel (2,306) dan perbandingan umpan C (umpan bungkil kelapa dan ampas kelapa) t-hitung (0,081) < t-tabel (2,306). Adapun, penggunaam bubu payung dapat dikatakan efektif dalam menangkap kepiting bakau dan hasil tangkapan sampingan.

Kata kunci: Bubu Payung, Umpan, Kepiting Bakau, Desa Sapat

1. Introduction

Kuala Indragiri District, located within the Indragiri Hilir Regency, is known for its geographical features that directly impact the activities of local fishermen who capture mangrove crabs (*Scylla* sp). The area spans approximately 517.25 km^2 and has a central elevation ranging from 3 to 4 mdpl. Located around the waters of the Indragiri River, ditches, and swamps, this sub-district has seven villages and one village.

One of the villages in Kuala Indragiri District is Sapat Village. The people of Sapat Village, especially in Parit 18, use pento fishing gear for catching mangrove crabs. Pento is a fishing gear consisting of a bamboo frame with a smaller tubular net in the middle. The tool has a diameter of 40 cm with a mesh of 5 cm. To prevent drifting away by the current, the pento is held with a bamboo pole stuck in the bottom of the water. This technique has long been used in mangrove crabs (Rahman, 2016). With the evolving times, fishing equipment has been altered, such as the introduction of bubu payung, which is more accessible and reasonably priced. The bubu payung features an octagonal frame constructed from materials often used in modern umbrellas. According to Kurniadi & Muhammad (2022), the bubu payung has a diameter of around 295 cm, a height of 30 cm, a radius length (skeleton) of 60 cm, with nets made of polyethylene (PE) material, and is equipped with 4-16 entrances and zippers for remove catches (Jayanto et al., 2018).

In Sapat Village, specifically in Parit 18, fishermen commonly utilize malong (*Muraenesox cinereus*) as bait for catching mangrove crabs using Bubu and other fish varieties. This study particularly emphasizes the area and coconut production in Indragiri Hilir Regency. According to data from the Directorate General, approximately 84.5% of coconut production in Riau Province originates from the Indragiri Hilir Regency. Given this circumstance, coconuts can be readily acquired and utilized for multiple purposes. As observed in scientific studies, one such use is as bait in bubu to catch mangrove crabs effectively.

This study examined the effectiveness of different bait options, such as malong, coconut meal, and coconut pulp, in attracting and catching mangrove crabs. Previous research by Abdullah (2018) in Sambuli Village, Kendari City, discovered that coconut meal in crab bubu fishing gear, and Gurusu et al. (2016) in the Menui Islands area, using coconut pulp as bait showed exciting results in crab fishing. Thus, this study focuses on fishing gear adaptation, exploration of new baits such as coconut meal and coconut pulp, and the potential utilization of local production products (such as coconuts) to increase mangrove crab catches in Kuala Indragiri District.

2. Material and Method

2.1. Time and Place

This research will be conducted on November 13-22, 2023, in the waters of Parit 18, a river located in Sapat Village, Kuala Indragiri District, Indragiri Hilir Regency.

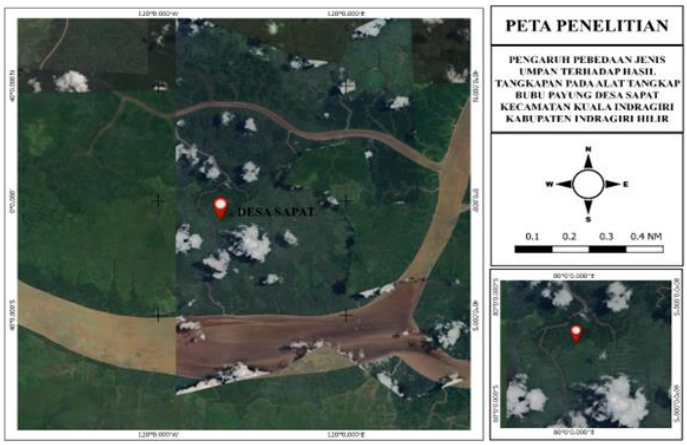

Figure 1. Research location

2.2. Methods

The method used in this study is the experimental fishing method. Sugiyono (2015) said the experimental method looks for the influence of specific other treatments under controlled conditions. According to Nazir (2003), the experimental method is observation under artificial conditions, where researchers make the conditions.

2.3. Data Analysis

This study used statistical analysis of t-tests to determine the effect of different baits on catches. So, this study used the t-test (Sudjana, 1984). The result of the T value obtained compared with the t table. Suppose the t-value is more significant than the t-table. It means that bubu payung affects the catch of mangrove crabs. If the t-value is smaller than the t-table, then bubu payung does not affect the catch of mangrove crabs. After the data is obtained,

it will be tabulated as images and graphs. Then, it will be analyzed descriptively with references related to the research to draw the research results.

3. Result and Discussion

3.1. Bubu Payung Construction

The bubu payung has an octagonal or octagonal shape, a size of 82 cm in diameter, a circle of bubu payung of 260 cm, a height of 30 cm, a length radius (skeleton) of 60 cm each distance of 37 cm, a net made of polyethylene (PE) material, mesh size 0.5 mm, entrance number 8 with the size of the entrance diameter 20 cm, entrance circle 40 cm, entrance length 15 cm, An jab (inside the entrance) measuring 16x10x10 cm, a 20 cm long zipper, a spring lock button, pulley/runner, stretcher, and rod/tube (Figure 2).

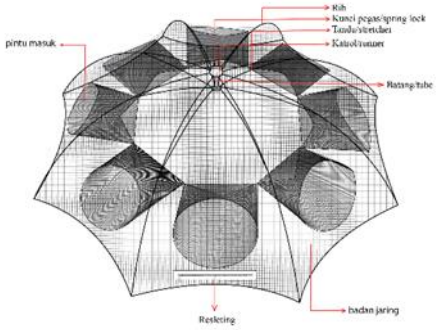

Figure 2. Construction of bubu payung

3.2. The Number of Catches by Individual (Fish)

The collected catch data are daily repeat data, including the number of main catches, bycatch, and discard based on individual (fish) using malong fish bait, coconut meal, and coconut pulp. Table 1 shows the number of catches of 12 bubu payung units for ten days.

Table 1. Number of main catch, bycatch, and discard based on individual (fish) Based on the Three Types of Bait

Days of Operation	Time of observation	Bait		
		Malong	Coconut meal	Coconut Dregs
1	November 13th	62	16	47
2	November 14th	20	53	33
3	November 15th	31	24	19
4	November 16th	22	28	14
5	November 17th	24	24	35
6	November 18th	16	40	19
7	November 19th	33	27	27
8	November 20th	20	11	28
9	November 21th	40	22	15
10	November 22nd	19	25	29
Total		287	270	266

The data in Table 1 shows the number of individuals caught in 12 units, with four units each using malong fish, coconut meal, and coconut pulp bait for ten days. It is known that the number of malong bait caught is 287, coconut meal 270, and coconut pulp 266. In malong bait, the most catches were obtained in the first repetition, with a total catch of 62, dominated by tenggek shrimp (*Litopenaeus vannamei*) with a total of 42. In contrast, the least was obtained in the sixth repetition, with a catch of 16. The most coconut meal catches were obtained in the sixth repetition, with a catch of 40. The most common catch is tenggek shrimp, which has a total of 20. at the same time, the least was obtained in the eighth repetition with a catch of 11. As for coconut pulp bait, the most catch was obtained in the first repetition with a catch of 47, tenggek shrimp with a total of 17, and the minor catch was obtained in the fourth repetition with a catch of 14.

3.3. The Number of Catches by Weight (g)

The data in Table 2 shows the weight of the catch on 12 units of bubu payung for four units each using malong bait, coconut meal, and coconut pulp for ten days. It is known that malong bait weighs 5955 g, coconut meal 3903 g, and coconut pulp 1913 g. In the malong bait, the heaviest catch was obtained in the first repetition with a total weight of 763 g. The main catch is mangrove crabs with a total weight of 520 g. In comparison, bycatch among other tenggek shrimp is 58 g, rock shrimp (*Macrobrachium equids*) 7 g, betutu (*Bostrychus sinensis*) 56 g, tembusung (*Acentrogobius caninus*) 122 g, and discard puffer fish (*Tetraodontidae* sp). At the same time, the smallest was obtained in the tenth repetition with a catch weight of 389 g. Among other things, the main catch is

mangrove crabs with a total weight of 451 g, while bycatch among other tenggek shrimp 29 g, rock shrimp 23 g, betutu 23 g, and tembusung 35 g.

Table 2. Number of main catch, bycatch, and discard based on individual (g) based on the three types of bait

Days of Operation	Time of observation	Bait		
		Malong	Coconut meal	Coconut dregs
1	November 13th	763	450	301
2	November 14th	541	163	225
3	November 15th	668	348	68
4	November 16th	455	450	67
5	November 17th	665	399	379
6	November 18th	452	493	82
7	November 19th	604	447	245
8	November 20th	857	64	178
9	November 21th	561	770	103
10	November 22nd	389	319	265
Total		5955	3903	1913

The heaviest catch of coconut meal was obtained in the ninth repetition with a catch weight of 770 g. The main catch is mangrove crabs with a total weight of 701 g, while bycatch among other tenggek shrimp is 17 g, rock shrimp 7 g, betutu g 21 g, and tembusung 24 g. At the same time, the smallest was obtained in the eighth repetition with a catch weight of 64 g. In comparison, bycatch among other tenggek shrimp is 8 g, rock shrimp 7 g, betutu 26 g, and tembusung g 23 g. As for coconut pulp bait, the largest catch weight was obtained in the fifth repetition, with a catch weight of 379 grams. The main catch is mangrove crabs with a total weight of g grams, while bycatch among other tenggek shrimp is 29 g, rock shrimp 16 g, betutu 28 g, and tembusung 74 g. The smallest catch weight was obtained in the fourth repetition, with a catch of 67 g. While bycatch among other tenggek shrimp 12 g, rock shrimp 3 g, betutu 34 g, and tembusung 18 g.

3.4. Composition of the Catch

The catches of the bubu umbrella can be grouped into the main catch, bycatch, and discard. The main catch consists of mangrove crabs, and bycatch consists of betutu, tembusung, tenggek shrimp, rock shrimp, and eel (*Monopterus albus*). The discard consists of mudskipper (*Periopthalmus sp*) and puffer fish (*Tetraodontidae sp*). The main catch, bycatch, and discard on bubu payung using malong bait are listed in the following Table 3.

Table 3. The number of main catch, bycatch, and discard of bubu payung using malong bait

Days of Operation	Time of observation	Number of Individuals (fish)		
		Main catch	Bycatch	Discard
1	November 13th	4	58	1
2	November 14th	3	27	0
3	November 15th	4	29	0
4	November 16th	3	21	1
5	November 17th	3	21	0
6	November 18th	2	14	0
7	November 19th	3	31	1
8	November 20th	4	16	1
9	November 21th	3	37	0
10	November 22nd	2	17	0
Total		31	271	4

From Table 3, it can be seen that the main catch using malong bait during the study amounted to 31 fish with an average per day of 3.1 fish, bycatch amounted to 271 heads with an average per day of 27.1 fish, and the catch of 4 fish with an average per day of 0.4 fish. Feed is a crucial factor in the operation of fishing gear. According to Bakhtiar et al. (2013), bait invites or stimulates fish to make the operating system more effective. Based on the results of interviews with fishermen, malong is commonly used to catch mangrove crabs. The bait is easy to get and has been provided by the group leader and as an enumerator. Meanwhile, coconut meal bait and coconut pulp bait are in line with research conducted by Abdullah (2018) in Sambuli Village, Kendari City, using coconut meal in crab bubu fishing gear and Gurusu (2016) in the Menui Islands Region using coconut pulp as bait.

Table 4 shows the catch of mangrove crabs (*Scylla* sp) malong bait is the main number of individuals, 31, with an average per day of 3.1. In contrast, the main catch number of individuals for coconut meals is 19, with an average per day of 1.9, and coconut pulp has the lowest total main catch, with a total of 4 and an average per day of 0.4. Based on the research results by Supadminingsih et al. (2015), the bait favored by crabs is the fresh bait, which smells fishy and rancid. Because crabs have a high sensitivity to concentrated odors, this statement is

reinforced by Arios's (2013) bait that is very jolting will attract the attention of crabs because it has an olfactory that is very sensitive to the smell of fresh bait, shows more results and has a larger size.

Table 4. The number of main catch, bycatch, and discard of bubu payung using coconut meal bait

Days of Operation	Time of observation	Number of Individuals (fish)		
		Main catch	Bycatch	Discard
1	November 13th	3	13	0
2	November 14th	0	53	0
3	November 15th	2	22	2
4	November 16th	2	26	0
5	November 17th	2	21	0
6	November 18th	3	36	2
7	November 19th	2	25	0
8	November 20th	0	11	0
9	November 21th	4	18	0
10	November 22nd	1	24	0
Total		19	249	4

Table 5. Number of main catch, bycatch, and discard of bubu payung using coconut dregs bait

Days of Operation	Time of observation	Number of Individuals (fish)		
		Main catch	Bycatch	Discard
1	November 13th	0	48	1
2	November 14th	1	32	1
3	November 15th	0	19	0
4	November 16th	0	14	0
5	November 17th	1	34	0
6	November 18th	0	19	1
7	November 19th	1	26	0
8	November 20th	0	28	0
9	November 21th	0	15	0
10	November 22nd	1	28	0
Total		4	263	3

Table 4 shows that the main catch using coconut meal bait during the study amounted to 4 fish, with an average per day of 0.4 fish; bycatch amounted to 263 fish, with an average per day of 26.3 fish; and the catch of 3 fish of waste had an average per day of 0.3 fish. Based on the results of experiments that have been carried out, it was obtained from the catch of 10, with the main catch of mangrove crabs totaling 54, weighing 102-412 g. According to Siahainenia (2009), the life cycle of mangrove crabs includes four stages (stadia) of development, namely: larval stage (zoea), analyzing stage, juvenile crab stage, and adult crab stage. Based on their habitat (Tarumasely et al., 2022), mangrove crabs are found in muddy habitats, and young and adult crabs are often found in holes in muddy habitats and between mangrove roots. Generally, mangrove crabs dig holes in mangrove areas on soft substrates to hide from enemies or avoid the sun. According to Herliany & Zamdial (2015), the size of the carapace width in male mangrove crabs ranges between 70-193 mm, while the carapace width in female mangrove crabs is 83-180 mm. Mangrove crabs are said to have matured if they have a carapace width of more than 100 mm (Wijaya et al., 2010).

In addition, there are bycatches caught by the bubu payung. The five species most often caught are betutu, tembusung, tenggek shrimp, rock shrimp, and eel. Species classified into bycatch are catches that can still be marketed to the local community or are economically valuable and safe for consumption. Tenggek shrimp results from the most bycatch caught by bubu payung, which is as many as 443 fish with a total weight of 599 g. This is an omnivore shrimp (animals, plants, and carrion). The existence of this shrimp is almost evenly distributed in all waters, with a relatively large number of individuals in Indragiri Hilir Regency.

The high value of bycatch compared to the main catch can be caused by inadequate fishing gear factors in catching mangrove crabs. The diameter of the net thread is 0.25 mm, which makes it easy to tear the net and lose it. In addition, the skeleton made of iron also prevents the bubu payung from lasting long because it rusts quickly. The large biodiversity of Indonesian waters is also one of the reasons for the many types of bycatch species caught by the bubu payung. In addition, during these observations, no protected species were caught by the bubu payung. When these observations are made, the catch of bubu payung in the fishing season tends to catch a variety of species in one operation with a small number of individuals (fish).

4. Conclusions

Based on the results of the study, the conclusions that can be drawn are as follows: The use of the bubu umbrella proved effective in catching mangrove crabs. The advantage of the bubu payung lies in the design that can provide hiding places and become an effective trap for mangrove crabs. The three types of bait used in bubu

payung significantly influenced the careful selection of bait that can increase the productivity of mangrove crab catches.

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