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Modification of Eco-Friendly Collapsible Crab Pot of Blue Swimming Crab in Pangkep Regency, Indonesia

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Abstract:
The aim of this study is to determine the effect of mesh size on the catches of small crab (Portunus sp.) both in number, carapace length (CL), and catchability between modified and control collapsible crab pot. This study used mesh size of the wrapping net (PE) from 2.5 cm (± 1 inch) to 7.0 cm (± 2.5 inches) with 20 units and 20 repetitions (trips). The results showed that different mesh size has a significant effect on the catch of the pot. However, the catch of a 2.5-inch mesh size- showed a larger carapace length = 42 individuals (85.7 %), while the escaped number was 44 individuals (63.7%) in the unfeasible category catch while the remaining 25 samples (36.2%) are eligible to catch. The Anova test on the catch of crab pot with a mesh size of 2.5 inches and 1 inch based on CL showed F-count > F_table (54.213 > 3.016) or sig. value <0.05 (0.00<0.05) which means that the size of the crab pot had a significant effect on CL. This identified that the size of the collapsible crab pot with a mesh size of 2.5 inches could pass small crabs and can only catch large crabs.

Keywords: *Collapsible crab pot, Portunus sp, eco-friendly fishing gear*

1. Introduction

Pangkep Regency is one of the regencies in the Makassar Strait where many fishermen catch small crabs (Portunus sp) using demersal and fixed gill nets and collapsible crab pot (local name: rakkang). The fishing ground is usually in estuarine and coral reef areas; crab pot are used for fishing as bait, such as Leiognathus spp, Sardinella, and Tilapia, while the gill net operates in coral areas (Arif M, 2018). Rajungan (*Portunus* sp.) is a crustacean that has a natural habitat in the sea and carries out ontogeny migration because there is a habitat shift that is carried out throughout the metamorphosis of its life cycle from the egg phase released into the waters to become larvae, juveniles, and adult crabs.

Adam et al. (2020) explained that one of the fishing gears for catching blue crab in Pangkep is a type of bottom gillnet with a mesh size is 9 cm with an operating time of 14-24 hours. The main catch was 55.6% (blue swimming), and bycatch (other types of crabs) was 44.44%, with various sizes, of which 29.6% were discarded (25% dead and 75% alive). Meanwhile, Jafar L (2011) explains that overfishing in the last 15 years (1997-2011) in the Salemo Island (Pangkep area) showed a decrease in CL of blue swimming size from 120 mm to 50 mm.

A collapsible crab pot is widely used by fishermen because it is easy to operate and can be folded to be easily carried on ships in large quantities and the price is relatively low compared to other types of fishing gear. The use of folding collapsible crab pot is increasingly widespread, not only for catching blue swimming but also for catching mangrove (mud) crabs.

Based on the Regulation of the Indonesian Minister of Maritime Affairs and Fisheries No.17/Permen-KP/2021, it is explained that the requirements for crabs (Scylla spp) that may be caught for domestic consumption or export are those with a minimum CL of the above 10 cm (100 mm) with a minimum weight of 150 grams with the condition of not laying eggs. As for blue swimming crab (*Portunus* sp.) for the purpose of fishing is in a non-laying condition, with a minimum CL of 10 cm (100 mm) and a minimum weight of 60 grams, catching using passive and environmentally friendly fishing gear in accordance with the provisions of the law-invitation.

2. Research Purposes

This study aims to determine the effect of mesh size on the number and size CL of catches (blue swimming crabs).

3. Method

This experimental fishing research was conducted in the waters of north Pangkep Regency, South Sulawesi, from August to September 2022 (Figure 1). The research was carried out by modifying the collapsible crab pot used by fishermen, round in shape with a conical top, made of bamboo, by changing the mesh size of the wrapping net (PE) from 2.5 cm (± 1 inch) to 7.0 cm (± 2.5inch), used cemen as a sinker and having one entrance and inside there bait installation (Figure 2). The mesh size is made large (± 2.5 inches) so that small crabs can escape easily and without defects or death. The outside of the modified crab pot (±2.5 inches) was covered with a net (mesh size of 1 inch), and for the purpose of the research, was made 20 units.

The setting of the crab pot is strung together with the fishermen's crab pot, alternately with every distance of 5 fishermen's crab pot interspersed with 1 modified crab pot. As a control, crab pot # 1 inch was used in the line of settings, and data collection was carried out for 20 trips.

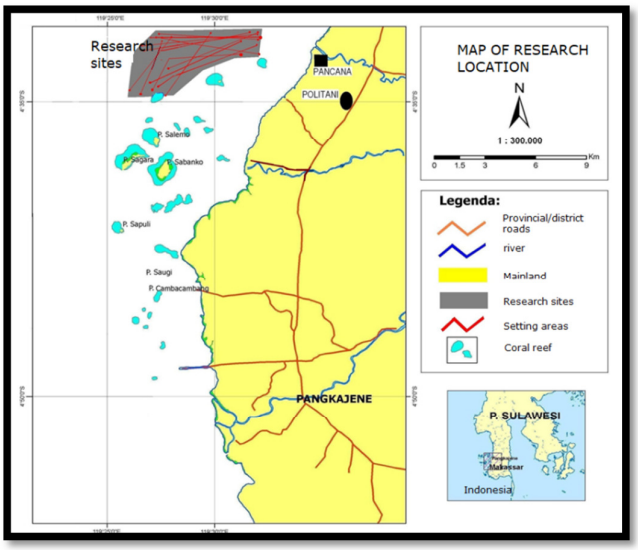

Figure 1: The Locations of Fishing Ground during Research

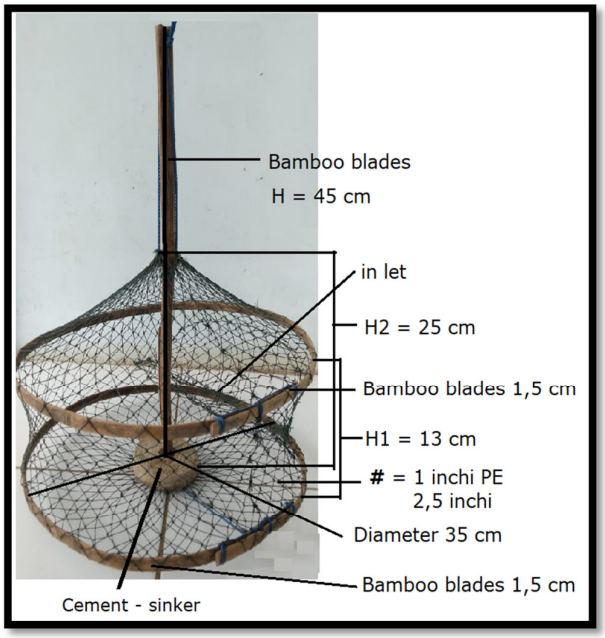

Figure 2: Basic Construction of Modified Collapsible Crab Pot (±1 inch; ±2.5 inches)

The data obtained was first tested using the normality test after the data were normally distributed. Then the data were processed using the T-test (Independent sample t-test) with a hypothesis: H0 = Differences in fishing gear have no effect on catch data. H1 = Differences in fishing gear affect catch data. The rule used in decision making: if the significance value of 2 - Tailed > 0.05, then H0 is rejected, and if the significance value of 2 - Tailed < 0.05, then H1 is accepted.

Construction	Specifications
Name	One-door modified folding net trap
Bubu Size	35 cm x 13 cm x 35 cm (Ø x h1 x h2)
Number of entrances	1 door, side door
Modification Type	The mesh size of the trap net is replaced with a size of 2.5 inches. There is a modification of the size of the mesh size of the net so that small catches can pass through the body of the trap net.
Frame	Bamboo
Net body (cover net)	PE mesh size 2.5 inches, 210 D/18

Table 1: Specifications of One-Door Modified Collapsible Crab Pot

The research data collection method is carried out as follows:

- Conduct field observations or direct surveys of crabs caught by crab fishermen, namely carapace size and type of crab,
- Manufacture/modification of environmentally friendly crab fishing gear in accordance with ad. 1 results to determine the type of fishing gear to be modified, its size or construction, and
- Selectivity trials on modifications of environmentally friendly crab fishing gear according to the time and in the waters where fishermen usually catch crab crabs

Data analysis was carried out quantitatively on: the number of caught crab crabs and the size of the carapace and compared with the catch of crab fishermen using fishing gear commonly used by fishermen so far.

4. Results and Discussion

Data on blue swimming crab (*Portunus* sp.) caught during the study are as follows: The results of the study found variations in the size of the carapace length caught both in net traps with a mesh size of 2.5 inches (A) and those that escaped (B). Based on the table of results of separation of types of net traps, the total length of crab carapace (A & B) caught is with a minimum carapace length of 6.5 cm and a maximum length of 14.3 cm where the highest frequency of catches on trap net A is in the length class 10.5-11.4 cm with the smallest size the carapace length of the caught crab was 09.5 cm and the largest size was 14.3 cm. The smallest crab carapace length caught was 6.5 cm, and the largest size was 13.6 cm, with the highest frequency in the 9.5-10.4 cm class. The variation in the length of the carapace of the crab crabs can be caused by factors such as age and food availability. Prakoso (2005) in Ramdani (2007) state that there are two factors that influence the capture of blue swimming crabs, namely natural factors and artificial factors. Natural factors include the development of life, the influence of the lunar cycle, and feeding habits, while one of the artificial factors is a bait that functions as a lure that influences behavior.

The average size of the carapace length of the crab caught by trap A was 09.5-14.3 cm, with the carapace size of the 09.5-10.4 cm class as many as 9 individuals (17.6 %) were not worth catching while the rest with a class length of 10.5-14.3 cm were 85.7% (42 individuals) were in the appropriate category to catch out of a total of 51 caught in accordance with the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia no. 17 of 2021. The catch of this crab, in general, has complied with the regulation where the crab crabs that may be caught are by carapace length above 10 cm.

The size of the carapace of the crab that was able to escape from net trap A consisted of 7 levels of carapace length class, namely the length of 6.5-10.4 cm, as many as 44 samples out of a total of 69 samples (63.7%) were not yet suitable for capture while the rest were long class 10.5-12.4 cm with a total sample of 25 samples (36.2%) in the category of catch. An Anova test on crab data caught from net traps with a mesh size of 2.5 inches and 1 inch based on carapace length shows that F_ count > F_table (54,213 > 3.016 or by looking at the sig. value < 0.05 (0.00 < 0.05), which means the size of the net traps has a significant effect on the size of the carapace length of the caught crab. This identified that the size of the net trap with a mesh size of 2.5 cm could allow small crabs to escape and only catch large crabs.

Small crabs with a carapace length of <9 cm can escape from the net traps with a mesh size of 2.5 inches, while crab crabs with a carapace length of > 9 cm generally cannot escape. This shows that using net traps with a mesh size of 2.5 inches is effective in escaping small crabs (not worth catching). Figure 3 shows a comparison of the length of the carapace classes of caught, escaped, and control crabs.

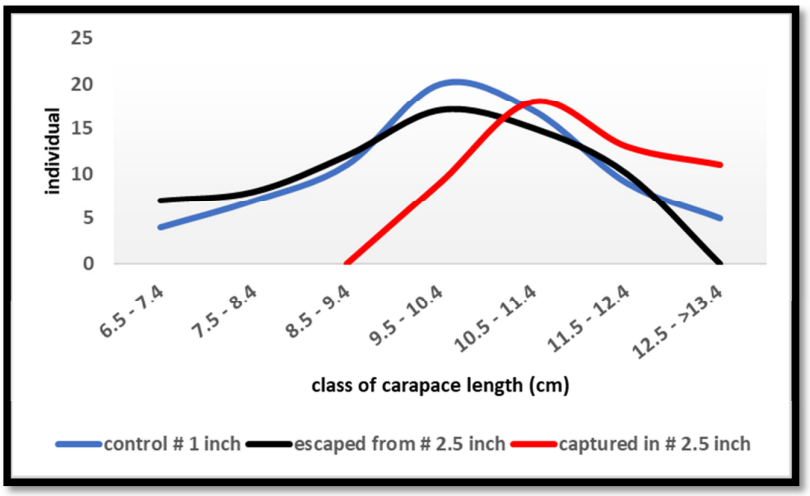

Figure 3: Comparison Graph of Carapace Class Length of Caught, Escaped, and Control Crabs

Processing data on the catch of small crab crabs on the shape of net traps with different mesh sizes (with the SPSS program) shows the following results 1) Corrected Model: If the sig value < 0.05 = significant, 0.000 < 0.005 means the model is valid; 2) Intercepts: Sig < 0.05 significant intercept; and 3) The significance value of the net crab traps with a mesh size of 1 inch and a mesh size of 2.5 inches shows a significant value < 0.05 or if F_count > F_table. The results of the data processing above prove that there is a significant (significant) difference in the effect of the size of the mesh size of the net trap on the carapace length of the caught blue swimming, namely that the net trap with a mesh size of 2.5 inches produces a catch of crab with a larger carapace size, small crabs will be able to escape (not get caught) with this net trap.

5. Conclusion

Based on the results of research on the modification of eco-friendly fishing gear of Portunus sp in Pangkep Regency can be conducted that the crabs caught in net traps (mesh size = 2.5 inches) a total of 51 individuals, while those that were able to escape were 69 individuals while the catches in control traps were as many as 73 individuals, the carapace length of the blue swimming is 6.5 - 14.3 cm. The crabs that were able to escape from trap net A consisted of 69 samples (63.7%) that were not yet fit to be caught, while the remaining 25 samples (36.2%) were in the category of suitable capture, there were 9 crabs (17.6%) caught by trap A that were not worth catching while 42 crabs (85.7%) were worth catching. The significance value of the group of crabs that escaped and those caught in a 2.5-inch mesh size showed a significant value <0.05 or if F_count > F_table and Net traps (mesh size ± 2.5 inches) mesh size produce crab catches with larger carapace sizes (according to or small crab crabs will be able to escape (not be caught) with trap nets in accordance with the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia no. 17th year 2021. Further research is needed on using this mesh size for other types of traps, according to those used by small crab fishermen.

6. References

i. Adam, Muklisa, Hasmawati, (2020). Analysis of the level of selectivity of blue crab nets in the waters of Pangkep Regency. Journal of Lutjanus, ISSN: 0853-7658, pp. 75–86.
ii. Amri, A. (2005). utilization and management of marine and fishery resources in the Spermonde Archipelago, guidelines of utilization and management of marine and fishery resources in Spermonde Archipelago.
iii. Arief, M. (2020). Population structure of blue crab (*Portunus pelagicus*) caught with gill net and bubu trap net by Sabangko island fishermen, Pangkep Regency, Thesis, Department of Fisheries, Faculty of Marine Sciences and Fisheries, Hasanuddin University.
iv. Jafar L, (2011). Crab fisheries in Mattiro Bombang village, Pangkep Regency, Thesis, Department of Fisheries, Faculty of Marine Sciences and Fisheries, Hasanuddin University.
v. Susanto, (2007). Study of environmentally friendly crab fishing gear in the waters of Pangkep Regency, Journal of Agrisistem, December 2007, Vol. 3 No. 2. Retrieved April 20, 2022, from: https://www.researchgate.net/publication/333971174