



Vol. 43 No. 2 March 2024, pp. 21-28

Trial of Pocong Fishing Equipment as an Effort to Catch Seeds in the Waters of Lhokseudu Beach, Aceh Besar

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Abstract—One of the fishing techniques used by fishermen to catch lobster seeds is using a "trap" fishing tool known as "pocong" and hanging it from a cage. adding attractors with the aim of attracting the attention of the seeds, namely green LED (Light Emitting Diode) dipping lights and also coconut leaves. The research method used is experimental fishing using 4 pocog fishing gear which are operated simultaneously, each using an attractor and without an attractor. The research was conducted from September 2021 to January 2022 at Lhokseudu Beach. The seeds caught include clear lobster seeds, pistol shrimp seeds, papermint shrimp seeds, giant prawn seeds, and coral fish seeds, and crabs. The catches were analyzed using the ANOVA test which showed that the number of catches was not significantly different between treatments. The highest productivity value was found in pocong fishing gear with an LED dipped light attractor and coconut leaves, amounting to 317 fish/unit, while the lowest productivity was obtained by pocong fishing gear without an attractor, namely 218 fish/unit.

Keywords— Fishing Gear, Clear Lobster Seeds, Gun Shrimp Fry, Peppermint Shrimp Seeds, Giant Prawn Seeds.

I. INTRODUCTION

Lhokseudu Beach is located in Leupung District, Aceh Besar Regency in Gampong Layeun (Himam & Mawardi, 2018). Geographically, Gampong Layeun is located at coordinates 96°14"30"E and 5°20"40"N, where to the east it borders Gampong Pulot, to the south it borders West Lhong sub-district and to the north it borders the Sea. Gampong Layeun has an area of 153.43 ha (Asiah, 2017). It has a beautiful coastline with abundant and diverse marine resources (Mawaddah, 2017), so that people's livelihoods move to the fisheries sector (Assyifa et al., 2019) and the economic-tourism sector (Mustaqimah et al., 2020).

The characteristics of the waters of Lhokseudu Beach tend to be calm because it is in the form of a basin surrounded by land

and covered with mangroves. Ecologically, mangroves play a role in being a place for organisms to spawn (spawning ground), forage for food (feeding ground), a place of care (nursery ground), and also a shelter or refuge (Santoro et al., 2019). Apart from that, the basic water substrate consists of coral rocks, coral fractures, mud and sand (Yuliani et al., 2016).

Biota has a life cycle so it will look for one of three ecosystems such as mangroves, seagrass and coral reefs. Fish have several life phases, one of which is the fry phase. The movement of seeds tends to depend on waves and currents, and is vulnerable to attack by predators. His instincts will lead him to take cover (Wandira et al., 2020), such as in the roots of mangrove trees, coral areas or coral faults (Fitriansyah et al., 2020). Supportive environmental conditions will influence the distribution and species that will be found because each seed has a tolerance limit for survival.

One of the fishing tools used to catch seeds is the pocong fishing tool which is the result of innovation from coastal communities in Lombok (Erlania et al., 2016), which has the function of protecting seeds in the water and the seeds like to approach objects that can be used. to protect itself from predator attacks (Wandira, Ramli, & Halili, 2020). This fishing gear has been used in several areas in Indonesia, such as in Bumbang Bay, Lombok (Sarbini & Nugraha, 2015), Pelabuhanratu Bay (Azzalea, 2019), in Pancer Village, East Java, and Ekas Bay, East Nusa Tenggara (Budiyanto, 2021).

This fishing gear is simple and does not require a large amount of capital so it does not burden the fishermen's economy if they want to use it (Erlania et al., 2016). The construction of fishing equipment consists of rope, waring made in the shape of a pocong (Djayanti et al., 2021), used sacks shaped like a fan and weights at the bottom (Sahru, 2018), then hung on the cage (Budiyanto, 2021).

One effort to increase catches using pocong fishing gear is to add attractors in the form of LED dipping lights and coconut leaves. Light has the function of stimulating biota to approach the light source to gather because it has positive phototaxis properties (Jayanto et al., 2016), while coconut leaves have the function of providing shelter for seeds in waters. Therefore, the fishing gear that will be used is pocong fishing gear without an attractor and pocong fishing gear with an attractor which is divided into 3, namely pocong fishing gear with a light attractor, pocong fishing gear with a leaf attractor and pocong fishing gear with a leaf attractor and pocong fishing gear with a leaf attractor and lights.

The results of the reference study show that there is no data regarding the abundance of seeds caught on Lhokseudu beach. Therefore, the research conducted trials of pocong fishing gear with and without an attractor to determine the catch, both composition and productivity.

II. RESEARCH METHODS

a. Tools and materials

This research activity uses several tools and materials used during the research. The tools and materials used are presented in Table 1.

| No | Tools and materials | Function |
|----|---------------------|---|
| 1. | 0.6 mm Nylon Rope | Tie the fan to the waring |
| 2. | 12 mm Nylon Rope | Tie the pocong fishing gear and in the cage |
| 3. | Used Feed Sacks | Materials for making fans and media for attaching seeds |
| 4. | Ballast | Ballast to sink pocong fishing gear |
| 5. | Waring | Media for attaching the fan |
| 6. | Cage | The media hangs pocong fishing gear |
| 7. | Light | Seed attractant |
| 8. | Coconut Leaves | Seed attractant |

Table 1. Tools and materials used in research

| 9. | Steroam | Media to accommodate seeds |
|-----|------------|----------------------------|
| 10. | Boat | Means to get to the cage |
| 11. | Cellphone | Documentation media |
| 12. | Stationery | Recording |

b. Research data collection procedures

The data collection method uses a survey method where the data collection technique uses the experimental fishing method, namely carrying out trials of the operation of four pocong fishing gear to catch seeds with different attractors. Samples are taken using the census sampling method, then seeds attached to fishing gear are identified, recorded and documented.

C. Installation and Construction of Pocong Fishing Equipment

The pocong fishing gear is installed in a cage that is 7 to 10 meters deep from the water bottom. This is the same as research conducted by (Sarbini & Nugraha, 2015) who installed pocong fishing gear in cages in Bumbang Bay, Central Lombok, West Nusa Tenggara.

Sampling was carried out 20 times with 4 fishing gear removals in 1 month. The first time the fishing gear was installed was in the afternoon and soaked at the research location for 1 week. After that, the fishing gear was removed in the morning at 7 am. The following is the design of the pocong fishing gear used during the research.



Figure 1. Construction design of Pocong fishing gear without attractor

The pocong fishing tool uses a light attractor totaling 3 lights hung at the top close to the fan position in the first row, as well as installing coconut leaves totaling 1 coconut leaf midrib. LED dipping lights have a 2AA dry battery energy source and require 1 batteries in one lamp.

Lifting the pocong fishing gear is done one by one by opening the hook on the cage and placing it in the basket. Then they were taken to the shelter house in the cage and checked one by one from the fans on the pocong fishing gear. The check was carried out twice to ensure that no biota remained, by dipping the fans in a bucket of water. After that, pour the water slowly and hold it using a filter. Do this several times so that no water comes out through the filter and makes it easier to check the amount of sample retained on the filter. Then record it and put the fishing gear back in the cage to be checked a week later.

D. Data Analysis

Data from each seed collected will be seen for its physical characteristics. These physical characteristics will be used as a reference in determining the species type of each individual seed, then they will be recorded and photographed. Statistical analysis was carried out using the ANOVA (Analysis of Variance) method using the SPSS application. The composition of the catch was analyzed descriptively-tabulatively. According to Choliq et al (1994) in Setyorini et al (2009) stated that the productivity of a fishing gear is measured including per unit of fishing gear, per person, and per fishing trip, so the formula used is:

Tail productivity/ unit= $\frac{\epsilon \text{ Production (tail)}}{\epsilon \text{ Fishing Gear (unit)}}$

III. RESULTS AND DISCUSSION

Catch Results on Pocong Fishing Gear

Catch data was collected based on activities during the research which came from the number of catches from pocong fishing gear without an attractor. Data collection was carried out for 5 months with 20 samples taken in the field. The following is a graph of the number of catches.



Figure 3. Graph of Number of Catches

Based on the graph above, it shows that the number of catches caught is dominated by pocong fishing gear with a leaf and light attractor (PDL), then pocong fishing gear with a leaf attractor (PD), then pocong fishing gear with a light attractor (PL), and fishing gear Pocong without an attractor (P) has lower catches compared to pocong fishing gear with an attractor. The installation of attractors has an impact on the number of catches, which is also proven by research conducted by Nevada, et al., (2012) where using two attractors at the same time, namely seaweed and coconut leaves, has a higher catch than using just seaweed.

LED dipped lights attract the attention of seeds because they have positive phototactic properties (Baswantara et al., 2020) while coconut leaves that have been submerged will become mossy and rot so that they become a food source for the seeds and have high resistance as an attractor (Hafinuddin et al., 2019).

Based on statistical tests to see differences in the number of catches using ANOVA analysis, it is presented in Table 2.

Table 2. Total catch in each treatment

| Parameter | Treatment | | | | |
|--------------|-------------------------|-------------------------|-------------------------|-----------------------------|--|
| | Р | PL | PD | PDL | |
| Catch (tail) | 146.17 ± 118.44^{a} | 158.50 ± 113.86^{a} | 181.17 ± 138.67^{a} | $227.00 \pm 157.14^{\rm a}$ | |

Type: P (pocong), PL (Pocong Lamp), PD (Pocong Daun), PDL (Pocong Leaf Lamp)

The total catch for each treatment during the study was P (146.17 fish), PL (158.50 fish), PD (181.17 fish) and PDL (227.00 fish). However, if tested statistically, the results are not significantly different between treatments. Then it was also analyzed how the total seed catch was seen in the month the research was conducted. The results of statistical tests using ANOVA are presented in table 3.

| Parameter | Month | | | | |
|-------------|-----------------------|----------------------|-----------------------|------------------------------|----------------------|
| | September | October | November | December | January |
| Total catch | 15.54 ± 11.13^{a} | 28.83 ± 28.03^{ab} | 45.25 ± 40.25^{b} | $44.96\pm36.34^{\mathrm{b}}$ | 39.04 ± 29.42^{ab} |

Type: P (pocong), PL (Pocong Lamp), PD (Pocong Daun), PDL (Pocong Leaf Lamp)

The total catch per month for all catches, obtained significantly different results if tested statistically, where November-December gave the highest catch among other months when sampling was carried out, and the lowest in September. This was influenced by field conditions during the research, where in September the rainfall was still high which affected temperature, salinity, pH, currents and waves, but in November the weather started to calm down even though it still rained occasionally but the intensity was not too frequent and high.

Composition of Catch

The species of seeds collected in pocong fishing gear and pocong fishing gear with attractors are very diverse, including lobster seeds, juvenile lobsters, fan lobster seeds, giant prawn seeds, pistol shrimp seeds, papermint shrimp seeds, crabs, and coral fish seeds.

The following is a graph of the composition of the catch.



Figure 4. Composition of Total Catch

Based on Figure 4, the highest composition is giant prawn seeds, namely 34%, then papermint shrimp seeds 29%, pistol shrimp seeds 17%, crab 12%, coral fish seeds 7% and clear lobster seeds 1%. The diversity of seed catches, which are dominated by crustacean seeds to fish, shows that fishing gear functions as a means of catching seeds. This shows that Lhokseudu Beach has high resource potential, even though the condition of the coral ecosystem according to Yuliani et al., (2016) is that coral cover has decreased, coral damage is dominated by rubble, and algae growth has increased. The existence of mangroves around the research location does not fail to provide an ecological role that can help the life cycle of biota.

Then the catch data was tabulated and statistical tests were carried out using ANOVA analysis to see the differences in the catches obtained during the research, which are presented in Table 3 below.

| Captured biota | Treatment | | | | | |
|-------------------|--------------------------|--------------------------|---------------------------|---------------------------|--|--|
| | Р | PL | PD | PDL | | |
| Lobster seeds | 0.50 ± 1.14^{a} | 0.60 ± 1.35^{a} | 0.50 ± 1.14^{a} | $0.70 \pm 1.17^{\rm a}$ | | |
| Giant prawns | $15.50 \pm 7.74^{\circ}$ | $16.90 \pm 8.46^{\circ}$ | $19.05\pm9.28^{\text{e}}$ | $20.20\pm9.25^{\rm c}$ | | |
| Gun Shrimp | 7.40 ± 2.70^{b} | 8.60 ± 2.90^{b} | 9.35 ± 3.21° | 10.95 ± 3.10^{b} | | |
| Peppermint shrimp | $12.65 \pm 6.62^{\circ}$ | $14.15 \pm 6.20^{\circ}$ | 15.00 ± 7.11^{d} | $17.70 \pm 10.36^{\circ}$ | | |
| Shell fish | 1.65 ± 2.54^{a} | 1.00 ± 1.52^{a} | 4.10 ± 2.51^{b} | $7.00\pm9.09^{\rm b}$ | | |
| Crab | $6.15 \pm 3,36^{b}$ | 6.30 ± 2.47^{b} | 6.35 ± 1.66^{bc} | $7.10\pm3.05^{\text{b}}$ | | |

Table 4. Number of Seeds in Each Fishing Gear

Type: P (pocong), PL (Pocong Lamp), PD (Pocong Leaf), PDL (Pocong Leaf Lamp)

The type of catch on each fishing gear gives significantly different results between the types of catch if seen from the statistics, where the highest average value for the catch is obtained by giant prawns (15.50-20.20), peppermint prawns (12.65- 17.70 fish), pistol shrimp (7.40-10.95 fish), crabs (6.15-7.10 fish), coral fish (1.65-7.00 fish) and the lowest in lobster seeds (0.50 -0.70).

There are several factors that influence the amount of catch attached to each fishing gear. According to Fitriansyah et al (2020) that the abundance of an organism in a body of water is closely related to oceanographic characteristics such as temperature, current speed, salinity, pH acidity, brightness and depth, in that water.

Where the pocong fishing gear is placed at a depth of 7 meters, with a temperature at Lhokseudu beach of 27oC with a salinity of 33 ppm and a pH of 7.5. Based on the SNI parameter values, the pH is 6.5 - 8.5, the temperature is 28 oC -30 oC (Siratu et al., 2018), so that the conditions of the Lhokseudu coastal waters are still comfortable for seeds to exist in these waters. Especially giant prawn seeds which are the largest catch of seeds. This is caused by the cycle of giant prawn seeds when the seeds are in saline waters, because they have euryhaline properties which enable them to grow and adapt to water conditions containing salt (Waluyo et al., 2018).

Fishing activities are also influenced by seasonal and weather factors. Seasonal changes will influence changes in the conditions of oceanographic factors, both physical and biological. These changes will certainly affect fishing operations related to the successful use of fishing gear, especially pocong (Ernawati et al., 2011). Thus, changes in seasons and weather will affect the catch and composition of the catch.

Productivity of Pocong Fishing Gear

Based on the total number of catches and fishing gear used, the productivity per unit of pocong fishing gear used can be calculated which is presented

| Pocong Fishing Tool | Total Catch (head) | Number of Units (Units) | Productivity (tails/unit) |
|---------------------|--------------------|-------------------------|---------------------------|
| Р | 872 | 4 | 218 |
| PL | 965 | 4 | 241.25 |
| PD | 1082 | 4 | 270.5 |
| PDL | 1268 | 4 | 317 |

Table 5. Comparison of Productivity Levels of Pocong Fishing Gear

Information :

P: Pocong fishing gear without attractor

PL: Pocong fishing gear with light attractor

PD: Pocong fishing tool with leaf attractor

PDL: Pocong fishing tool with leaf attractor and light

The level of productivity is based on Table 5. It shows that the number of fishing gear used has the highest productivity value in pocong fishing gear with an LED dipping light attractor and coconut leaves at 317 fish/unit, while the lowest productivity was obtained by pocong fishing gear without an attractor, namely 218 fish/unit. units. This shows that the installation of LED dipping lights and coconut leaves increases the productivity of pocong fishing gear. Similar study results also occurred in research by Zuriat et al., (2019) where the use of traditional FADs using coconut leaves, areca palm leaves and nipa palm leaves caught more fish than FADs using raffia rope attractors.

The high and low levels of productivity of a fishing gear are influenced by several factors such as the type and number of attractors used, season and weather which influence the abundance of fish, fish movement and fish behavior (Ernawati et al., 2011). Based on research by Daris et al (2021), the seasonal factor is one of the obstacles, where the eastern season from June to September is the season for catching squid while the western season from October to May is a transition season, so that each season influences type and amount of catch.

IV. CONCLUSION

Based on the results of research conducted at Lhokseudu Beach regarding Trials of Pocong Fishing Gear as an Effort to Catch Seeds in the Waters of Lhokseudu Beach, Aceh Besar, it can be concluded as follows:

- 1. The fishing gear with the highest number of catches was the pocong fishing gear with a leaf and light attractor (PDL) with 1268 fish, then the pocong fishing gear with a leaf attractor (PD) with 1082 fish, then the pocong fishing gear with a light attractor (PL) with a total of 1082 fish. 965 fish, and pocong fishing gear without attractors (P) as many as 872 fish.
- 2. The biota caught included giant prawn seeds, peppermint shrimp, pistol shrimp, crabs, coral fish, lobster seeds, with the highest composition being giant prawn seeds and the lowest being lobster seeds.
- 3. The highest productivity value was found in pocong fishing gear with an LED dipped light attractor and coconut leaves at 317 fish/unit, while the lowest productivity was obtained by pocong fishing gear without an attractor, namely 218 fish/unit
- 4. Factors that influence catch results include season, weather, water conditions (temperature, salinity, pH), and number of attractors.

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