Comparison of John's snapper (*Lutjanus johnii*) catch results using three types of attractors with wire traps in the Rigaih waters of Aceh Jaya, Indonesia

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Abstract. Trap fishing is a traditional fishing method that is widely used by fishermen on the coast of Indonesia. Fishermen in Rigaih Aceh Jaya catch bottom fish using fishing rods, gill nets, and longlines. However, the catch using these methods is not optimal, and the John's snapper fish (*Lutjanus johnii*, Bloch 1792) resources in Rigaih waters have not been optimally utilized. Attractor wire trap fishing gear is needed to utilize these resources. The main reason for capturing *L. johnii* lies in its high economic value. One of the important components of the trap is the attractor material, namely coconut leaves, areca nut leaves, and palm fiber that attracts fish. This study aimed to evaluate differences in catch composition, the proportion of target species *L. johnii* and by-catch fish, the distribution of total fish length, and determine the relative effectiveness of three types of attractors. The research method involved experimental fishing using 15 wire trap units with a 3 day soaking test in 9 fishing trips. The results of the study showed that the coconut leaf attractor yielded 171 tails and 309 kg, the areca nut leaf 95 tails and 141.5 kg, and the palm fiber 74 tails and 74.9 kg. Non-parametric statistical tests showed a significant difference in catches using coconut leaves compared to those using areca nut and palm fiber attractors.

Key Words: fish catches, wire trap fishing, coconut leaf attractor, areca nut leaf, palm fiber.

Introduction. Trap fishing is a traditional method widely used by fishermen in the coastal areas of Indonesia, including Aceh. This fishing gear has advantages in terms of simplicity of construction, relatively low operational costs, and the ability to catch demersal and coral fish with high selectivity (Prihantoko et al 2023). In Aceh, an important target species is John's snapper (*Lutjanus johnii*, Bloch, 1792), locally known as jenaha, which has high economic value and constitutes a major commodity for local fishers. Recent baseline assessments have established the general composition and size structure of *L. johnii* catches using unbaited/unmodified wire traps in Rigaih waters (Nasruddin et al 2025). These findings provide essential baseline information on the effectiveness of wire traps for demersal fisheries in the region. Although the baseline performance of wire traps has been established, further optimization is needed to improve catch efficiency. One practical approach is the use of attractors to encourage fish to aggregate near the trap entrance and within the trap catch zone, thereby increasing capture success (Prihantoko et al 2025). However, the specific impact of attractor materials on catch efficiency and selectivity remains unquantified. Several locally available natural materials, such as coconut leaves and areca nut leaves (Afriani et al 2024), as well as palm fiber (Hafinuddin et al 2025), are commonly used by fishers as attractors and as trap/covering materials. These materials are easily obtained and differ in their physical characteristics, and are therefore expected to exert different effects on trap attractiveness to target species. Moreover, covering material is an important component of trap construction because it can function as a passive attractor by creating shelter, like conditions that resemble natural habitats, which in turn may influence both the number and composition of fish entering the trap (Simbolon et al 2011). The use of coconut leaves, areca nut leaves, and palm fiber as attractor/cover materials may also help reduce coral reef impacts associated with trap fisheries (Diniah & Yusfiandayani 2012). Selecting appropriate cover materials is therefore not only intended to increase catches quantitatively, but also to support sustainable fisheries by maintaining selectivity in terms of catch size and species composition (FAO 2003).

Based on this rationale, this study addresses the knowledge gap by experimentally comparing the performance of three locally sourced attractor types including coconut leaves, areca nut leaves, and palm fiber in wire trap fishing operations. The wire trap specifications, deployment protocols (depth, duration, location), and environmental parameters are identical to those described in Nasruddin et al (2025). This study aimed to compare the effectiveness of the three attractor types in terms of catch number and catch composition, with a particular focus on *L. johnii*. The findings are expected to provide empirical evidence on the most effective and practical attractor material for local fishers, and to inform technical improvements to enhance the effectiveness and efficiency of wire trap operations in a sustainable manner.

Material and Method

Research framework. This research is based on data collected during the same field campaign previously reported by Nasruddin et al (2025). While the earlier study focused on describing overall catch composition, size distribution, and maturity-related parameters of demersal species captured using wire traps, the present study addresses a distinct research objective by conducting a comparative experimental analysis of different type attractor materials. The study area, sampling period, fishing grounds, environmental conditions, and general fishing operations were identical to those described in Nasruddin et al (2025), thereby ensuring consistency in baseline conditions across analyses.

Description of the research location. The location of this research was the Lhok Rigaih Fish Landing Base (PPI), which is located in Rigaih Village, Setia Bakti District, Aceh Jaya Regency, at coordinates 4°39'46’’N and 95°33'22’’E (Figure 1).

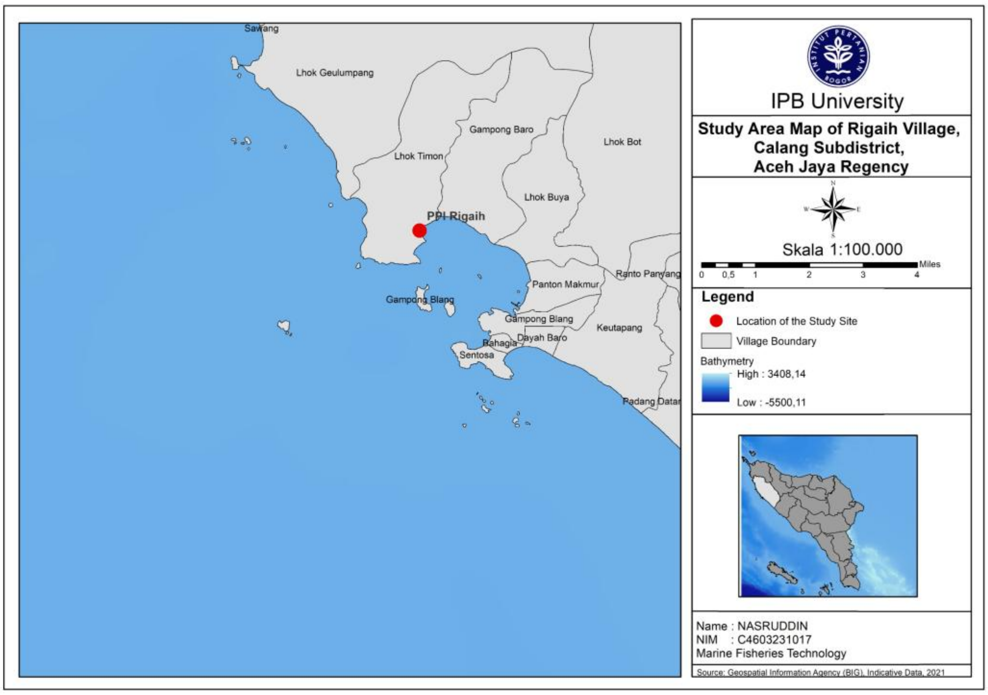

Figure 1. Location of wire trap research in the waters of Rigaih Aceh Jaya.

The Lhok Rigaih PPI functions as a center for small-scale capture fishery activities which use a fleet of vessels with a capacity of 5–12 GT. This PPI has a strategic position because it is located in the fisheries management area (FMA) 572, which is one of the potential fisheries centers on the west coast of Aceh. The facilities and infrastructure of Lhok Rigaih PPI are still limited, thus not fully supporting the optimization of capture fisheries activities (DKP 2022). This port is frequently visited by vessels from other regions, such as purse-seine and tonda vessels, which unload their catch. The Lhok Rigaih PPI also functions as a place for fish trading transactions and as a primary distribution point for catches, including large pelagic *Thunnus albacares* (*Thunnus* sp.), small pelagic scad (*Decapterus* spp.), kawakawa (*Euthynnus affinis*), skipjack tuna (*Katsuwonus pelamis*), demersal fish, and reef fish, which are then marketed to the Aceh Jaya region and surrounding areas. The results of this study reinforce previous findings that *L. johnii* and *Epinephelus malabaricus* are important economic commodities in the FMA 572 region and demonstrate the potential for developing wire trap fisheries with attractors as an environmentally friendly fishing method (Yusfiandayani et al 2020).

Description of wire traps. In this study, specimens of *L. johnii* were captured using wire traps 120 cm in length, 100 cm in width, and 75 cm in height (Figure 2). Specifications of the wire traps, including construction materials (PVC-coated 2 mm woven wire), dimensions, and deployment protocols followed the standardized design described in Nasruddin et al (2025). Detailed information regarding trap construction and baseline fishing operations is therefore not repeated here. The experimental component of the present study consisted of modifying the standard wire trap design through the installation of three different attractor materials. The present study modified the standard design by installing three different attractor types, coconut leaf attractors (n=5), areca nut leaf attractors (n=5), and palm fiber attractors (n=5). Attractors were randomly assigned to traps prior to deployment to minimize spatial and operational bias. All traps were deployed simultaneously under comparable environmental conditions. The traps are operated from an 8 GT vessel installed on the bottom of muddy waters at a depth of 23–25 m. The traps were installed by fishermen using a longline system, with a distance of 25 m between traps. The traps were installed in the morning and, after soaking for three days, the traps were hauled out the next morning. This trap design and operating method align with similar research in Indonesia, which shows that wire traps are an effective and selective passive fishing gear for demersal fish (Vivi et al 2023). The selectivity of wire traps to fish species and size has been demonstrated in various studies (Kholis & Syuhada 2021). The results of the study show that a soaking duration of 3–4 days provides better fishing performance when using wire traps (Setiyono et al 2016).

Data collection. Data collection was conducted using wire traps in December – January 2024 using three types of attractor wire traps (areca nut leaves, coconut leaves, and palm fiber). The wire traps used are shown in (Figure 2). The data collected included data on the weight of fish, number of fish species, bycatch, fork length measurements, body height measurements, and body girth measurements on each fishing gear pull.

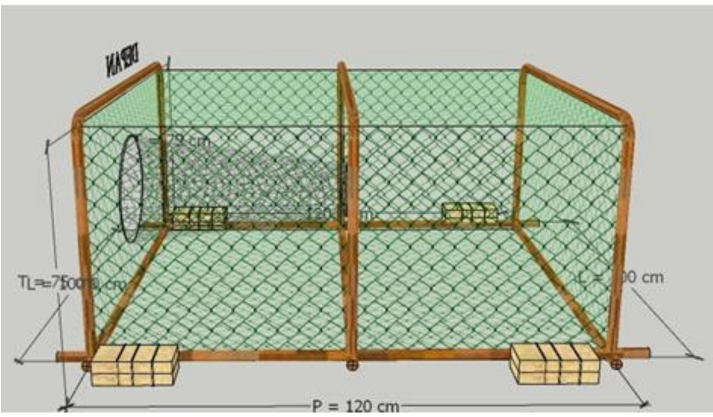

Figure 2. Construction of a wire trap.

Research method. The research method used in this study operated fishing gear (experimental fishing). The wire traps used were 15 units with three types of attractors, namely areca nut leaves, coconut leaves, and palm fiber, with nine repetitions. The fishing gear was immersed for 3 days at a depth of 23-25 m within a fishing ground distance of 9–10 nautical miles. This study was conducted in the waters of Rigaih (FMA 572), Aceh Jaya Regency. The wire traps using different attractors are presented in (Figure 3).

a. Coconut leaf wire trap b. Areca nut leaf wire trap c. Palm fiber wire trap

Figure 3. Construction of a wire trap attractor.

Data analysis. Catch data of *L. johnii* obtained from each attractor treatment were analyzed to assess differences in catch number and biomass. Non-parametric statistical tests (Kruskal–Wallis) were applied due to non-normal data distribution, followed by post hoc comparisons where appropriate. Statistical analyses were performed to determine whether attractor type significantly influenced catch performance. In the first stage of the research, data in the form of the type and number of catches, total length, body girth, body height, and weight of the catch of *L. johnii* and several other dominant fish were analyzed descriptively. The data obtained from the catch of wire traps were then tabulated in Microsoft Excel and used to calculate the composition of the catch, according to Susaniati et al (2013):

$$Pi\ (\%) = (ni/N) \times 100$$

Where:
Pi - species composition (%);
ni - total weight of each species caught (kg);
N - weight of all species caught (kg).

The analysis used in this study is a quantitative descriptive analysis, namely adding up data on the number, weight, size, and ratio of catches. Data processing was performed with the ANOVA linear model:

$$Yij = \mu + \pi i + €ij$$

Where:
Yij - hauling time difference value;
μ - mean value of treatment;
πi - effect of treatment i;
€ij - influence of the experimental error (human error);
i - number of treatments;
j - number of repetitions (1,2,3...).

If the treatment was significantly different (the calculated F-statistic was greater than the critical F-value from the F-distribution table), then a least significant difference post-hoc test (LSD) was conducted using the equation:

$$LSD = t_{\alpha,\ dferror} \times [(2 \times MSE)/r]^{1/2}$$

Where:
$t_{\alpha,\ dferror}$ - the critical value from the Student test distribution;
α - the significance level;
df_{error} - the degree of freedom for the error term, obtained from the ANOVA table;

MSE - the mean square error, obtained from the ANOVA table;
r - the number of replications or observations per treatment group.

Results

Identification of catches from wire mesh traps using attractors. Overall, catches from wire mesh traps using attractors of areca nut leaves, coconut leaves, and palm fiber were recorded during nine fishing trips. The catches from the three wire mesh traps using attractors are listed in (Table 1).

Table 1
The total composition of the catch in wire traps using coconut leaf, areca nut leaf, and palm fiber attractors

Species	*Areca palm leaf*		*Coconut palm leaf*		*Palm fiber*		*Total no of ind.*	*Total weight (kg)*
	No of fish	*Weight*	*No of fish*	*Weight*	*No of fish*	*Weight*		
Lutjanus johnii	56	95.5	110	177.2	18	25.2	184	297.90
Lutjanus campechanus	9	13.6	4	3.5	3	4.2	16	21.3
Epinephelus malabaricus	5	12	26	109.6	2	2.3	33	123.9
Caranx sexfasciatus	4	1.2	18	5.4	2	0.6	24	7.2
Sepia sp.	3	2.1	8	5.3	20	14.5	31	21.9
Rachycentron canadum	2	4.8	2	4.8	0	0	4	9.6
Balistapus undulatus	2	2.2	2	2.6	14	13	18	17.8
Dasyatis pastinaca	7	7.1	0	0	12	11.6	19	18.7
Johnius sp.	3	1.8	1	0.6	3	3.5	7	5.9
Gerres sp.	4	1.2	0	0	0	0	4	1.2
Total	95	141.5	171	309	74	74.9	340	525.4

Based on Table 1, the total catch in this study using three types of attractors was 340 fish with a total weight of 525.4 kg. The highest catch of the 10 types of species caught above was the *L. johnii* with a total of 184 fish weighing 297.90 kg. The catch using the areca leaf attractor was 95 fish weighing 141.5 kg, the head leaf was 171 fish weighing 309 kg, and the palm fiber was 74 fish weighing 74.9 kg. The overall catch with the wire trap using the three types of coconut leaf attractors was superior compared to the areca leaf and palm fiber attractors. The attractors in the form of areca leaf, coconut leaf and palm fiber used in fishing gear are tools that can invite bottom fish to gather in a water area (Yusfiandayani 2004). *L. johnii* is one of the target fish species caught using wire traps. Other fish species caught using wire traps in the Rigaih waters of Aceh Jaya Regency include *Lutjanus campechanus*, *E. malabaricus*, *Caranx sexfasciatus*, *Sepia* sp., *Balistapus undulatus*, *Dasyatis pastinaca*, *Johnius* sp. and *Gerres* sp. Altinagac et al (2022) explained that attractors are one of the main components of fish aggregating devices (FADs) because they function as actual fish collection tools. Therefore, the use of attractors may enhance the effectiveness of capture in wire traps by increasing the presence of fish around the gear. Aquatic animals enter entrapment gear through their own movements and are often attracted by bait, the presence of other animals, or the apparent shelter provided by the gear. In general, entrapment gears are designed to exploit the behavior of aquatic animals, such as migration, shelter-seeking habits, escape responses, and feeding behavior (Hubert et al 2012). Coconut leaf attractants are excellent for use in fishing with wire traps in the waters of Rigaih, Aceh Jaya. The research results are expected to provide a scientific basis for fishermen and policymakers in selecting optimal trap covering materials, thereby increasing catch without compromising the sustainability of fish resources in the waters off Rigaih, Aceh Jaya.

Total catch ratio for the three types of attractors. *L. johnii* dominated the catch with a proportion of 54% of the total catch for all three types of attractors, consistently with the findings of Nasruddin et al (2025), which reported that wire traps operated in the Rigaih waters predominantly caught *L. johnii* (Figure 4). This dominance indicates that wire traps with a combination of areca nut, coconut, and palm fiber attractors are effective in attracting the main target demersal species. This finding is consistent with (Setiawan et al 2019), which states that the use of natural attractors can increase the attraction of target fish through visual and olfactory stimuli in coral habitats

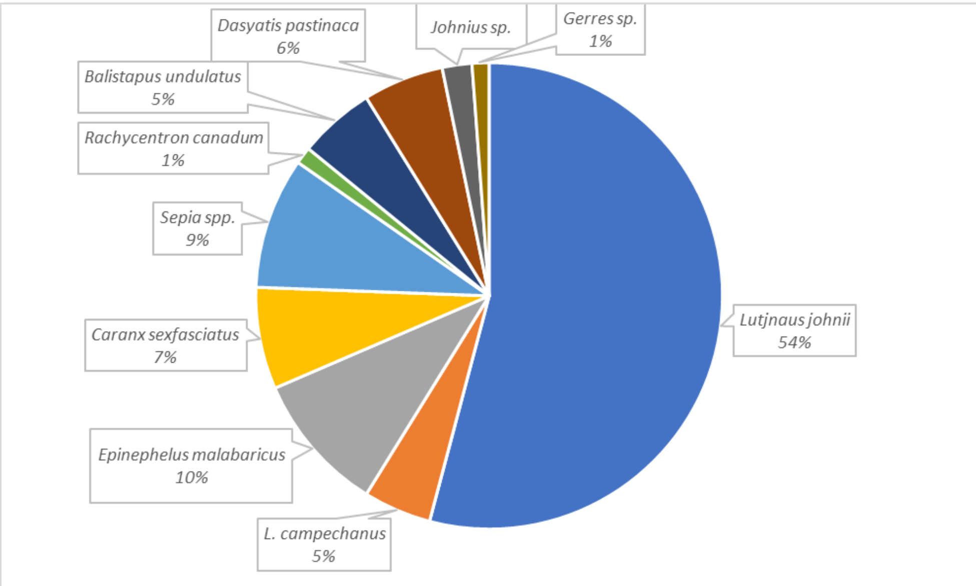

Figure 4. Composition of the catch of three types of attractors.

Besides *L. johnii*, several other species were captured, contributing a combined proportion of 46% of the total catch, consisting of *E. malabaricus*, *Sepia* sp., *C. sexfasciatus*, *L. campechanus*, *B. undulatus*, *Gerres* sp., *R. canadum, D. pastinaca* and *Johnius* sp., with each species contributing in a proportion of less than 10%. This diversity illustrates that wire mesh traps have a multi-species catch, which can increase fishermen's income but requires sustainable management to prevent overexploitation (Sinaga et al 2011). Overall, these results confirm that the combined use of the three types of attractants can increase the effectiveness of wire mesh traps while maintaining selectivity for the primary target species. However, the proportion of non-target catches indicating monitoring still requires to ensure that fishing activities do not negatively impact the populations of other species.

Composition of the catch of the three types of attractors

Areca palm leaf. Based on the bar chart, *L. johnii* was identified as the most dominant species caught using wire traps equipped with areca palm attractors, with a total weight of 95.5 kg and 56 individuals. This dominance indicates that the areca leaf attractor is highly effective in attracting demersal target species, particularly those belonging to the Lutjanidae family. This finding is consistent with (Setiawan et al 2019), who reported that natural attractor materials such as areca leaves can imitate the structural and color characteristics of natural habitats, thereby attracting reefs and demersal fish to seek shelter or foraging areas nearby. Other captured species included *L. campechanus* (13.6 kg), *E. malabaricus* (12 kg), and *C. sexfasciatus* (1.2 kg), indicating a catch composition of considerable economic value. Additionally, non-target species, such as *Sepia* sp., *D. pastinaca*, and *B. undulatus*, were found in smaller quantities. The presence of these species suggests that the use of areca leaf attractors not only enhances selectivity toward target fish, but also supports a multi-species catch while maintaining focus on the main target species (Hafinuddin et al 2025).

The catch composition indicated that the use of areca leaf attractors achieves a balance between fishing efficiency and ecosystem sustainability. The fibrous texture and dark coloration of areca leaves serve as strong visual and tactile stimuli, making them effective in luring demersal fish. This observation aligns with the (FAO 2022) perspective, which emphasizes that natural materials in environmentally friendly fishing gear can improve capture efficiency without causing degradation to benthic habitats. Overall, the results demonstrate that wire traps with areca leaf attractors exhibit high selectivity for key target species, such as *L. johnii*, and can be recommended as a sustainable fishing technology suitable for small-scale fisheries in tropical Indonesian waters (Figure 5).

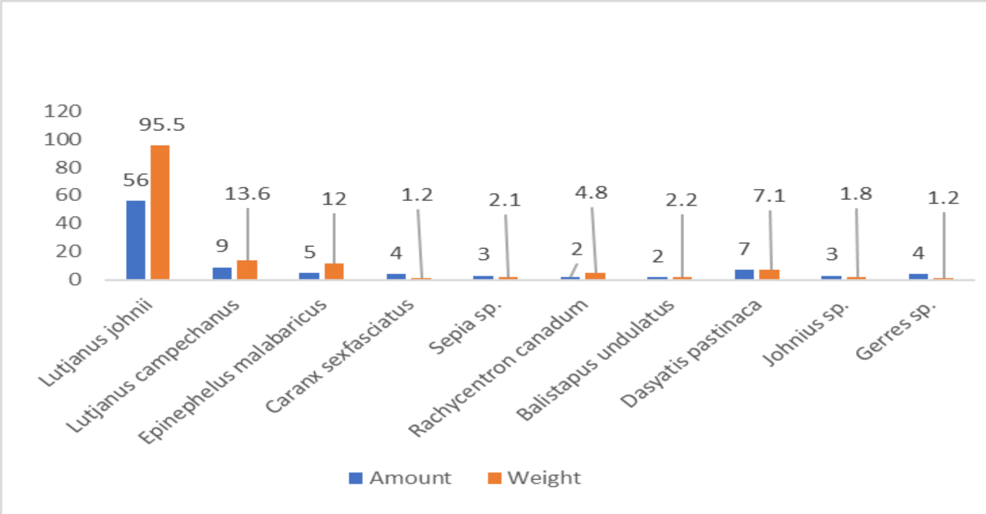

Figure 5. Composition of the catch on the areca nut attractor.

Coconut palm leaf. The bar chart illustrates that the use of coconut leaf attractors resulted in a dominant catch of *L. johnii* and *L. malabaricus*, with total weights of 177.2 kg (110 individuals) and 109.6 kg (26 individuals), respectively. The dominance of these two species indicates that coconut leaves are highly effective in attracting fish from the Lutjanidae family, which represents a high-value target species in tropical demersal fisheries. This finding is consistent with Setiawan et al (2019), who reported that natural attractor materials, such as coconut leaves, create visual and structural effects resembling coral reef habitats, thus stimulating fish aggregation and feeding activity near traps. In addition to the main target species, the catch also included *C. sexfaciatus* (18 individuals, 5.4 kg), *E. malabaricus* (4 individuals, 3.5 kg), and small quantities of non-target species, such as *Sepia* sp., *B. udulatus*, and *D. pastinaca.* This species diversity demonstrates that the use of coconut leaf attractors promotes a multi-species catch, while maintaining high selectivity for target species. According to Kholis et al (2021), the selectivity of environmentally friendly fishing gear is reflected in the dominance of the target species and low proportion of bycatch.

The broad and flexible structure of coconut leaves likely generates dynamic visual and motion stimuli underwater, attracting both reef-associated and demersal fish. As highlighted by the FAO (2022), the physical characteristics of natural attractor materials play a critical role in enhancing fishing efficiency without causing physical disturbances to benthic habitats. Therefore, the application of coconut leaf attractors in wire traps can be considered an environmentally friendly fishing method that aligns with the principles of Ecosystem-Based Fisheries Management (EBFM).

Overall, these results indicate that the use of coconut leaf attractors optimizes the capture of economically valuable target species while maintaining ecological balance. Their availability, low cost, and biodegradability make coconuts a promising alternative attractor for the development of sustainable small-scale fisheries in tropical Indonesian waters. The distribution of catch composition is shown in Figure 6.

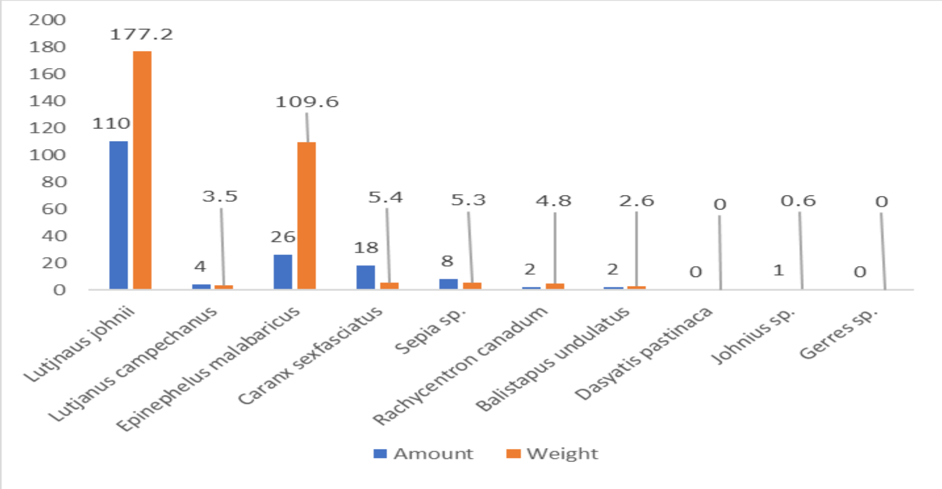

Figure 6. Composition of the catch in the coconut attractor.

Palm fiber. The research findings presented in the graph indicate that the use of ijuk (Arenga fiber) as an attractor in wire traps resulted in a catch predominantly composed of *L. johnii* with 18 individuals (25.2 kg), and *L. malabaricus*, with 20 individuals (14.5 kg). The dominance of these two species suggests that ijuk material is highly effective in attracting fish from the *Lutjanidae* family, which are demersal reef-associated species of high economic value. The fibrous texture and dark coloration of ijuk mimics the natural substrates commonly found in coral reef environments, such as sponges and seaweed. This resemblance likely creates favorable visual and tactile cues that enhance the attractiveness of the traps to the target fish species. This finding aligns with the study by Prihantoko et al (2023), which emphasized that natural materials resembling fish habitats can significantly increase both the visitation and retention rates of fish in passive fishing gear. Although other species, such as: stingrays, bearded croakers, and orange-spotted groupers, were also caught, their proportions were relatively small. This pattern indicates that the use of ijuk attractors maintains a desirable level of ecological selectivity, supporting environmentally friendly fishing practices, as outlined in the Ecosystem-Based Fisheries Management (EBFM) framework proposed by FAO (2022).

From an ecological standpoint, the application of natural materials such as ijuk is considered non-destructive to marine environments, in contrast to synthetic materials that may contribute to water pollution (Hafinuddin et al 2018). Therefore, the use of ijuk-based attractors in wire traps not only enhances catch efficiency, but also reinforces the principles of sustainable fisheries management within the Indonesian Fisheries Management Area (FMA 572), as illustrated in Figure 7.

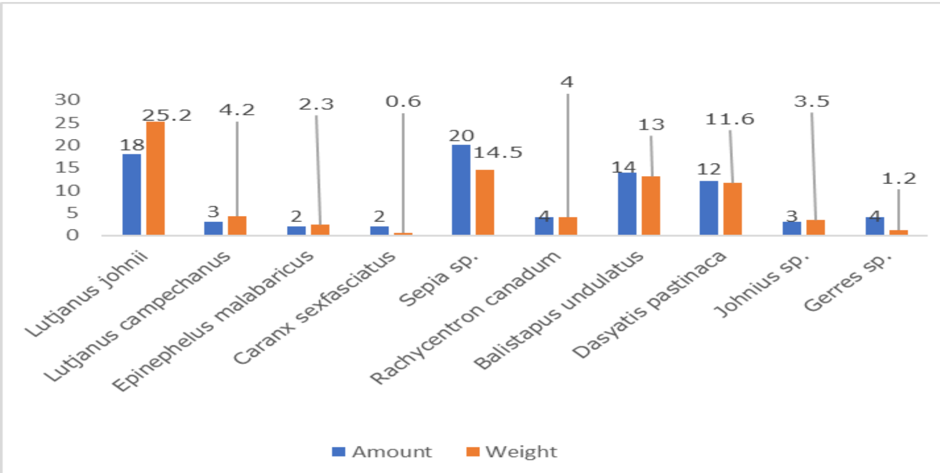

Figure 7. Composition of the catch on the palm fiber attractor.

Comparison of the total number and weight of fish caught on the three types of attractors. Consistent with baseline catch composition reported in Nasruddin et al (2025), *L. johnii* dominated the aggregate catch across all treatments (184 individuals, 297.90 kg), confirming the gears' effectiveness for this target species. Grouper was the next most important species, with 33 individuals and a substantial weight of 123.9 kg, making it a significant economic contributor despite its smaller number of individuals. Prihantoko et al (2023) reported that the effectiveness of attractors in wire traps is greatly influenced by the feeding behavior, natural habitat, and visual attraction of fish to the attractor material. International studies have also reported that the use of appropriate attractors can increase the attractiveness of traps by up to 60% to demersal and coral fish (Stewart & Ferrell 2003).

Sixteen *L. campechanus* specimens were recorded, weighing 21.3 kg, indicating a relatively small presence but still commercially valuable. *Sepia* sp. also contributed with 31 individuals weighing 21.9 kg, indicating that the attractor is capable of attracting non-fish organisms (cephalopods). Other species such as *B. undulatus* (18 individuals, 17.8 kg), *D. pastinaca* (19 individuals, 18.7 kg), *R. canadum*, *Gerres* sp., and *C. sexfasciatus* only contributed with small amounts in terms of both numbers and weight, as seen in Figure 8. Overall, this graph shows that the three attractors effectively captured the primary target fish, the *L. johnii*, while also increasing the diversity of the catch through the presence of other demersal and *Sepia* sp. This result is biologically important because it demonstrates a high selectivity for *L. johnii* while still supporting multi-species utilization that has the potential to increase fishermen's profits. The results of this study strengthen previous findings that *L. johnii* and *E. malabaricus* are important economic commodities in the FMA 572 region and show the potential for developing wire trap fisheries with attractors as an environmentally friendly fishing method (Subehi et al 2017).

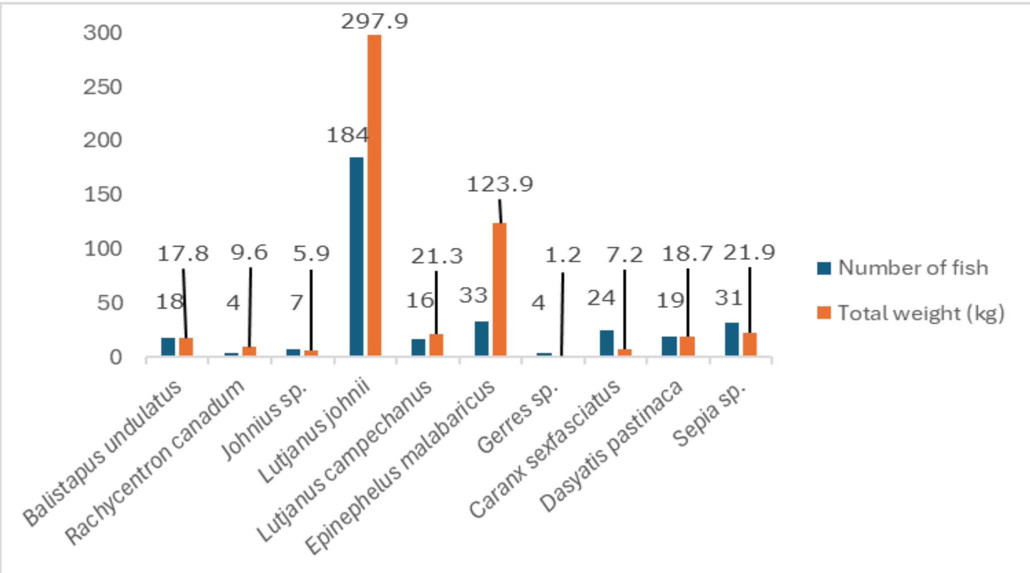

Figure 8. Comparison of the total number and weight of catches on three attractors.

The analysis showed that the treatment with coconut leaf cover resulted in the highest total catch weight (309 kg), with a target fish proportion of 54% of the total catch. This indicates that the use of coconut leaves causes the dominance of *L. johnii* species in the catch, thereby reducing community uniformity (Magurran 2004). A non-parametric statistical test (Kruskal–Wallis) showed that the catch weight of the coconut leaf treatment was significantly different from that of the palm fiber treatment ($p<0.05$), but not significantly different from that of the areca nut treatment. Further Mann–Whitney tests revealed that significant differences only occurred in weight parameters between the areca nut–palm fiber treatment =and coconut–palm fiber treatment ($p=0.000$), while no significant differences were found in the number and length of fish ($p>0.05$). These findings reinforce the argument that the choice of trap cover material plays a significant role in the quantity and composition of the catch. The use of coconut leaves consistently increased catch productivity but tended to decrease diversity because dominant species were caught more often. These results are in line research at TPI Kedung Malang Jepara which states that modifications to the design or materials of fishing gear can affect the selectivity and biodiversity of the catch (Subehi et al 2017). The results of the statistical analysis are shown in (Table 2).

Table 2

Results of statistical analysis of wire traps using different attractors

No	*Testing*	*Category*		
		Amount	*Long*	*Heavy*
1	Areca nut leaves and coconut leaves	0.543*	0.353*	0.669*
2	Areca nut leaves and palm fiber	0.647*	0.907*	0**
3	Coconut leaves and palm fiber	0.909*	0.181*	0**

*not significantly different; **significantly different

Further statistical tests showed that the use of attractor types in wire traps did not significantly affect the number or length of fish caught, with a p value>0.05 for all comparison pairs. This indicates that in terms of quantity and length, the fish responses to areca nut leaf, coconut leaf, and palm fiber attractors were relatively similar. However, in terms of catch weight parameters, a significant difference ($p<0.05$) was found between the palm fiber attractor and the other two attractors (areca nut and coconut leaves). This result is consistent with the descriptive analysis, which showed that the highest catch weight was obtained from the coconut leaf attractor (309 kg), followed by the areca nut leaf (141.5 kg), and the palm fiber (74.9 kg). This finding indicates that the coconut leaf attractor is more effective in attracting fish with a higher biomass, thus contributing to a greater economic catch. Ecologically, this may be due to the nature of coconut leaves, which have a larger surface area and complex fiber structure, thus providing a more attractive microhabitat for demersal fish. Therefore, the selection of coconut leaf attractors is recommended as an optimal alternative to increase the effectiveness of wire trap catches, especially when the main goal is to obtain higher fish biomass. This confirms the hypothesis that cover material influences catch results, but the effect is more significant on weight than on the number or length of fish.

Areca nut leaf treatment resulted in a total catch weight of 141.5 kg with a higher proportion of target species than coconut, namely 67.5%. Statistical tests showed that the catch weight of areca nut leaves was significantly different from that of palm fiber ($p<0.05$), but not significantly different from that of coconut. Meanwhile, palm fiber produced the lowest total catch weight, namely 74.9 kg, with a proportion of target species of only 33.6%. However, statistical tests showed that the catch weight of palm fiber was significantly different and lower than that of both coconut and areca nut leaves ($p<0.05$).

Ecologically, the lack of significant differences in the number of tails and length of fish between treatments indicated that the size structure and abundance of fish caught were relatively similar, regardless of the type of cover material. However, significant differences in weight indicated that certain cover materials attracted fish with larger body sizes and weights, even though the numbers of individuals were not significantly different. In the context of fisheries management, these results imply that the use of cover materials, such as coconut leaves or areca palm leaves, can provide greater economic benefits than palm fiber without drastically changing the size structure of the captured population.

Based on the combination of these indicators, the order of effectiveness of wire trap covering materials in this study is as follows:

1. Coconut leaves – High catch weight, large proportion of target species, statistically significant test results for coconut fiber.

2. Areca palm leaf – Medium catch weight, highest proportion of target species, statistically significant test results for palm fiber.
3. Ijuk - Lowest catch weight, low proportion of target species, but highest diversity value.

Overall, these results indicate that coconut leaves are the most effective cover material in terms of productivity, whereas areca nut leaves have the advantage of selectivity for the target species. Palm fibers significantly contribute to increasing catch diversity but are less effective in terms of catch quantity.

Conclusions. The type of wire trap cover material affects the catch of *L. johnii* in terms of the number and catch composition. Traps using coconut leaves caught *L. johnii* with the highest weight of 309 kg, which is 68% of the total catch; traps using areca nut leaves caught 95.6 kg of *L. johnii*, which is 73%, while traps using palm fiber attractors caught 25.2 kg of *L. johnii*, which is 28%. Statistical tests showed a significant difference in catch weight between palm fiber and the other two materials; however, the catch weights of coconut leaves and areca nuts were not significantly different. The effectiveness ranking was the highest for coconut leaves, followed by areca nuts and palm fiber, with recommendations for the use of rotation or a combination of cover materials to balance productivity and ecosystem sustainability.

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Conflict of interest. The authors declare that there is no conflict of interest.

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