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Original research article

The Composition of The Catch of Mini Purse Seine in The Java Sea

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ABSTRACT

Pelagic fish are a type of fish that live in groups, with their habitat in shallow waters or sea level. Groups of small pelagic fish living in coastal waters and juveniles (kids) are known to be more abundant on the north coast of Java, which is a traditional mini purse seine fishing area. This study aims to analyze the catch composition of the mini purse seine fishing unit, which is operated in the Java Sea. The composition of the catch obtained using the mini purse seine fishing gear operating in the northern part of the Java Sea is dominated by small pelagic fish, which are the main catches mackerel (Rastrelliger sp.) 76%, white sardinella (Sardinella sp.) 18 %, and Splendid ponyfish (Eubleekeria splendens) by 4%, as for the bycatch obtained in the form of Largehead hairtail (*Trichiurus lepturus*), squid (*Loligo sp.*), Kawakawa (*Euthynnus affinis*), and other fish.

Introduction

A mini purse seine is a fishing tool using nets as the main material, which is operated to catch pelagic fish (Rambun et al., 2016). Purse seine uses a net in the form of a rectangular bag, with parts of the fishing gear consisting of ropes, buoys, weights, nets, wings, and pockets (SNI 7277.3:2008). The technique of operating a mini purse seine by circling a school of pelagic fish, which after being collected, is carried out by hauling. Catching fish using a mini purse seine is an effective fishing method for catching pelagic fish (Anggraeni et al., 2015).

The distribution of fish in Indonesia is very dependent on natural conditions, causing the pattern of distribution of fish to be erratic. Fishing gear operated in Indonesian waters has many types and sizes, adjusted to the type of target fish found in each water (Nelwan et al., 2015). Pelagic fish are a type of fish that live in groups, with their habitat in shallow or sea surface waters (Mc Lintock, 1966). The main catch of the mini purse seine is pelagic fish, which include mackerel tuna (kawakawa), skipjack, yellowfin tuna, flying catfish, Largehead hairtail, white sardinella, and others. However, this fishing gear also

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has many other bycatches, depending on the operating area (Suwarso et al., 2008; Rosyidah et al., 2009; Utomo et al., 2013). According to Purwanto and Nugroho (2011), purse seines make a very large production contribution to the production of small pelagic fish, which production level is influenced by the use of machine traction, net size, and the power of the lights used. These three factors determine the level of productivity of mini purse seine catches.

According to Wijopriono & Mahiswara (2008), in the period 1999-2002, pelagic fish resources in the Java Sea experienced variations in distribution and abundance according to season. The peak abundance of pelagic fish in the northern Java inshore fishing grounds was dominated by white sardinella, which occurred in May, while the peak abundance of offshore pelagic fish, which was dominated by flying fish, occurred in September.

The abundance of pelagic fish is very sensitive to environmental changes (Perangin-angin et al., 2018), especially the spatial distribution of salinity generated by monsoon winds (Choerudin et al., 2022). In wet years, when rainfall is above normal (west monsoon), the penetration of oceanic fish into the Java Sea decreases due to reduced oceanic water mass in the eastern part of the Java Sea. There is a positive correlation between catches and surface salinity, but this shows a negative correlation with rainfall. Spatially, pelagic fish are spread eastward with concentrations of abundance in the eastern part of the Java Sea, the variability of several fish species associated with changes in salinity. According to Atmadja & Sadhotomo (1995), changes in environmental conditions affect certain types of fish to make migrations, such as flying fish and Indian mackerel which migrate following changes in water salinity. Meanwhile, groups of small pelagic fish that live in coastal waters and juveniles are known to be more abundant on the north coast of Java, which is a traditional mini purse seine fishing area (Choerudin et al., 2022). This study aims to analyze the catch composition of the mini purse seine fishing unit, which is operated in the Java Sea.

Methods

This study was carried out from March 1 to June 10, 2022, by following the operation of catching mini purse seine vessels in the Java Sea. The operation of this mini purse seine fishing gear is carried out during the day and at night, but when the fishing operation occurs at night when there is moonlight, the operation will be transferred to daytime.

The catch data on the purse seine fishing gear that has been obtained will then be analyzed by calculating the total number of each species compared to the total number of catches (Sutono et al., 2021) using Equation (1).

$$P = \frac{N_i}{N} x100\% \quad \text{.....(1)}$$

Information:
P : Catch species composition
N_i : The total weight of each species caught (kg)
N : Weight of all species caught (kg)

Results and Discussion

Catch Composition

The catch of the mini purse seine is dominated by small pelagic fish that have high economic value, but generally, this fishing gear also catches fish that are not the main target (Table 1 and Figure 1). According to Hariati (2011), the composition of pelagic fish catches in West Sumatra waters; the Banda Aceh waters is dominated by flying fish (*Decapterus macrosoma* and *Decapterus macarellus*) 30-36% and tuna (*Auxis sp.* and *Euthynnus sp.*) 60%. While the catch of the mini purse seine operating in the waters of Kupang Bay had the highest catch of 1980 kg tuna with a composition percentage of 88%, and the lowest catch was found in trevally fish with a composition percentage of 40 kg (1.78%); 40 kg of flying fish with a percentage composition of (1.78%) (Bere et al., 2021). According to Zamroni & Suwarso (2009), in the North Java Sea, there are catches of small pelagic fish dominated by scads (*Decapterus sp.*) because the North Java Sea is a very suitable habitat for scads to breed. Meanwhile, for mini purse seine vessels based around the Nusantara Fishery Port of Muara Angke, catches of small pelagic fish are not dominated by scads because the average mini purse seine vessels based at this port operate not too far from the fishing base.

Target Species Composition

The composition of the target species is dominated by small pelagic fish such as white sardinella (*Sardinella sp.*), mackerel (*Rastrelliger sp.*), and Splendid ponyfish (*Eubleekeria splendens*). For analysis of the species composition of the catch, it can be calculated by the total number of each species divided by the total number of catches and then multiplied by one hundred percent (Table 2).

The target species obtained was 18026 kg, with a ratio of each species to the main catch; the percentage composition of each species was obtained, including white sardinella fish (*Sardinella sp.*) at 18%, mackerel (*Rastrelliger sp.*) at 78%, and splendid ponyfish (*Eubleekeria splendens*) 4%. The composition of the main catch is 98% of the total catch.

Non-target Species (Bycatch) Composition

Non-target Species (Bycatch) are dominated by small pelagic fish such as Largehead hairtail (*Trichiurus lepturus*), squid (*Loligo sp.*), Kawakawa (*Euthynnus affinis*), and other fish. The bycatch composition obtained for *Trichiurus lepturus* was 29%, *Loligo* sp was 6%, and *Euthynnus affinis* was 65%, as can be seen in Table 3. The bycatch species composition analysis value is 2% of the total catch.

The waters of the northern part of the Java Sea are dominated by pelagic fish resources due to the temperature of the seawater, which tends to be warmer than in other waters. Pelagic fish have a very high occurrence in these waters, so pelagic fish are the main catch in the

Table 1 Composition of Mini Purse Seine Catches in the Java Sea

No.	Common Name	Scientific Name	Weight (kg)
1	White sardinella	*Sardinella sp.*	3.262
2	Mackerel	*Rastrelliger sp.*	14.092
3	Splendid ponyfish	*Eubleekeria splendens*	672
4	Largehead hairtail	*Trichiurus lepturus*	99,5
5	Squid	*Loligo sp.*	19,5
6	Kawakawa	*Euthynnus affinis*	222
	Total		18.367

Table 2 Target Species Composition

No	Common Name	Scientific Name	Weight (kg)	Species Composition (%)
1	White sardinella	*Sardinella sp*	3.262	18%
2	Mackerel	*Rastrelliger sp.*	14.092	78%
3	Splendid ponyfish	*Eubleekeria splendens*	672	4%
Total			18.026	100%

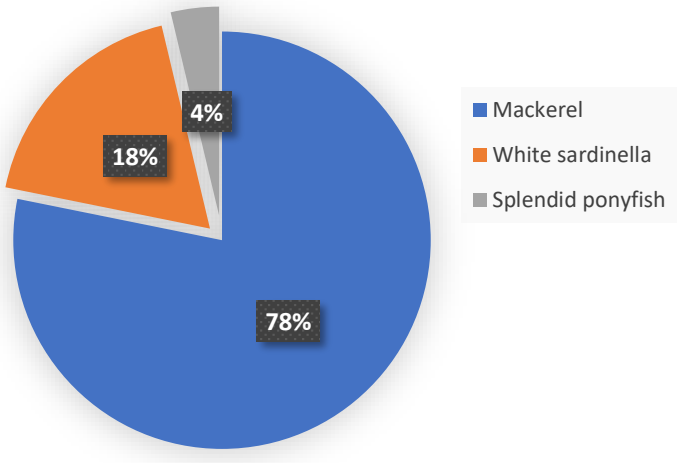

Figure 1 Pie chart of Target Species Composition

Table 3 Non-target Species (Bycatch) Composition

No.	Common Name	Scientific Name	Weight (kg)	Species Composition (%)
1	Largehead hairtail	*Trichiurus lepturus*	99,5	29%
2	Squid	*Loligo sp*	19,5	6%
3	Kawakawa	*Euthynnus affinis*	222	65%
Total			341	100%

waters of the northern Java Sea. The main types of pelagic fish caught in the waters of the northern Java Sea include mackerel, white sardinella, and other pelagic fish.

Conclusion

The composition of the catch obtained using the mini purse seine fishing gear operating in the northern part of the Java Sea is dominated by small pelagic fish, which are the main catches mackerel (*Rastrelliger sp.*) 76%, white sardinella (*Sardinella sp.*) 18 %, and Splendid ponyfish (*Eubleekeria splendens*) by 4%, as for the bycatch obtained in the form of Largehead hairtail (*Trichiurus lepturus*), squid (*Loligo sp.*), Kawakawa (*Euthynnus affinis*), and other fish.

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