

Catch analysis of squid trap fishing in coastal area of Rayong province, Thailand

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Introduction

Bigfin reef squid (*Sepioteuthis lessoniana* Lesson, 1830) is one of the important economic squid in Indo-Pacific waters including in the Gulf of Thailand and Andaman Sea. The catch in the Gulf of Thailand was 4,728 tons (fisheries statistics of Thailand, 2013). The squid is also important commercial resource for small-scale fisheries and the major fishing gear that fishers use to catch this species is squid trap, with the annual production was 1,665 tons (fisheries statistics of Thailand, 2013). It has high value for domestic markets in Thailand. In Rayong province, Eastern Gulf of Thailand, Bigfin reef squid production is higher than other provinces indicates that the squid trap fishery is important to the livelihood and economic of small-scale fishers. The squid trap is a traditional type of fishing gear widely used in Thai waters. It was modified from fish trap that represent one of the most effective fishing gear type. This trap has a high selectivity in order to catch squids for targeting Bigfin reef squid (Chotiyapuita and Yamrungreung, 1998). The catch compositions of squid trap composed Bigfin reef squid 86% (Udom and Nunthapon, 2012). This trap is usually deployed in the day time with the fishing ground of 3-40 m depth. It is set floating individually with the float line (Fig. 3). The operation methods, first place the squid eggs and white plastic bags in the trap after that shooting the trap, followed with the sinker and flag pole for marking position. After 1-2 days fishers approach to the fishing ground and trap positions, the fisher hauling up the rope line by winch. The traps are retrieved by moved up to sea surface onboard and scoop the catch out through the entrance and keep squids in the box, then fisher change the new squid eggs and continue deploy the traps in the same position for next shooting. The squids from the trap are very fresh and still alive. Squid trap fishery has a potential to make a significant seafood in Rayong province, but there are very few study reports and lack of data and information about this gear. The objectives of this study the catch of squid trap, catch species, catch compositions, relation between squid and fishing ground. Catch analysis of Rayong squid trap will be useful for fisheries data base and underwater observations to understand the capture process and the trap efficiency in the future.

Materials and Methods

This study was conducted in Rayong province. The fishing grounds was near Samet Island. The first trap was 15 km Semet Island shore and the last trap was 42 km. The round trip about 100 km from coastline. Squid traps were set at the depth of 10 to 40 m (Fig. 1) Rayong squid traps onboard surveyed was conducted on 13 March 2015. The trap made of wooden frame structure of 95 x 105 x 80 cm and covered with PE net of 70 mm mesh with one entrance funnel (Fig. 2). The trap floated above the seabed with the entrance facing upwards (Fig. 3) and soaking time 1-2 days. A portable GPS (Garmin-eTrex30) was used for tracking the fishing activity by

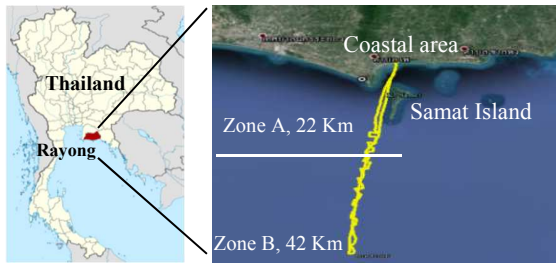


Fig. 1 Fishing grounds

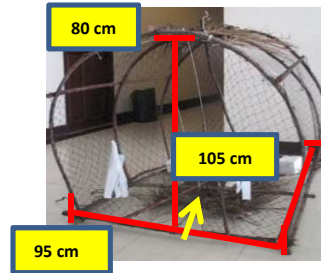


Fig. 2 Rayong squid trap

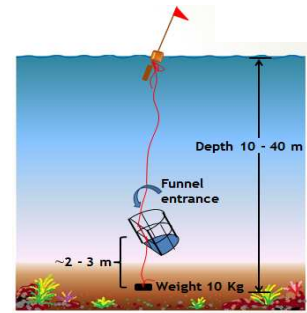


Fig. 3 Trap setting

handy depth meter (Hondex PS-7) to identify the depth for each trap in the fishing ground and in the research divide fishing ground by distance from the coastal, zone A from coastal 22 km (24-33 m depth), zone B from coastal 42 km (30-38 m depth) and random sampling 10 squids in a zone. The catch in each trap were recorded and identified. CPUE, catch compositions, numbers of caught squid were analyzed. For the squids, sexual and random sampling 70 % from total catch to measure the weight and mantle length (ML) were done. Data from the fisher log-book recording daily in Mar 2015 also were analyzed.

Results

The study results of catch analysis by squid trap on 13 March 2015, data from onboard survey the number of trap was 53 traps. The average CPUE was 2.64 individuals/trap. The total catch compositions of squid traps (% by No.) were 94% of Bigfin reef squid (*S. lessoniana*), 5% of fishes and 1% of Pharaoh cuttlefish (*Sepia pharaonis*). Bigfin reef squid were the main target of this gear and sexual composed 69% male and 31% female. Besides, 3 fish species were bycatch included Brownstripe red snapper (*Lutjanus vitta*), Longfin batfish (*Platax teira*) and Fan bellied leatherjacket fish (*Monacanthus chinensis*) (Fig. 4) The variations in the sizes frequency of the Bigfin reef squid by onboard survey random sampling 70 % from total catch were average squid size of male was larger than female. Average weight of Bigfin reef squid ranged 100-400 g, 306.3 g for male, 245.7 g for female. Mantle length (ML) of Bigfin reef squid were 15-29 cm (20.02 ± 3.53) cm for males, 10-24 cm (17.76 ± 3.27) cm for female. According to the data from the fisherman log-book in Mar 2015, the catch amount of main target was 659 kg and the fisher used 943 traps in total. The average CPUE was 0.70 kg/trap and 34.69 kg/day.

Relation between squid and fishing grounds, the numbers of trap in zone A 20 traps and zone B 33 traps. The average CPUE were 2.50 individuals/trap and 2.73 individuals/trap respectively (Table.1). Size of squid between zone A (shallower zone) and zone B (deeper zone), average weight were 295 g and mantle length 15-24 cm (19.80 ± 3.12) cm in zone A and average weight were 534 g and mantle length (ML) 22-29 cm (24.7 ± 2.11) cm in zone B.

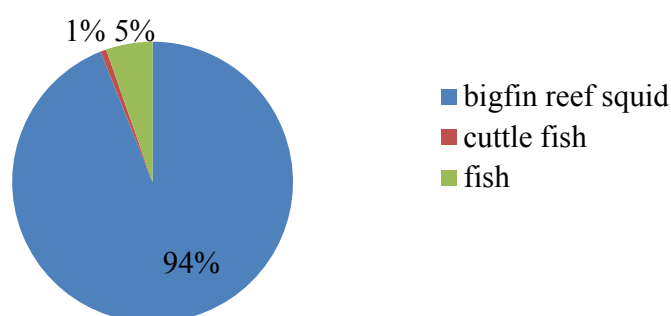


Fig. 4 Catch compositions

Table.1 The catch of Bighfin reef squid from zone A and zone B

Zone	Numbers of Bigfin reef squid				CPUE (individuals/trap)	Average size	
	Total	Male	Female	Trap		Weight(g)	Mantle length(cm)
Zone A	50	33	17	20	2.50	295	19.80
Zone B	90	63	27	33	2.73	534	24.70
Total	140	96	44	53	2.64		

Discussion

The catch of squid trap in Rayong province average CPUE was 2.64 individuals/trap. The Bigfind reef squid composed 94% by number as a major catch species in the compositions, followed with fishes and cuttlefish. This showed the similarly result as Anucha, et al, (2012); Udom and Nunthapon, (2012) who reported as 90% of the Bigfin reef squid. Moreover, bycatch species were also were reported such as crab (*Scylla* spp.) and blue swimming crab (*Portunus pelagicus*). Anyway, we did not find the 2 crab species that may because of different fishing ground and the deeper depth. The sizes of Bigfin reef squid male was larger than female, results were similar to those of Anyanee and Cherdchinda, (2005) showed 9.5 – 32.5 (17.77 ± 3.69) cm for male and 7.5 – 25.5 (15.75 ± 2.43) cm for female and as these result reported every month size of male was larger than female. According to fishing ground the sizes of squid in deeper water tended to be higher than shallower zones. There were relations between the catch amount and the depth of fishing ground, Anucha, et al, (2012) reported the suitable depth for squid trap was depth more than 20 m. This study suggests that in Rayong coastal area is suitable fishing ground of squid trap fishing with high selective function for target species. The observations by underwater camera to understand the capture process and to improve the catch efficiency are interesting to study in the future.

Reference

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