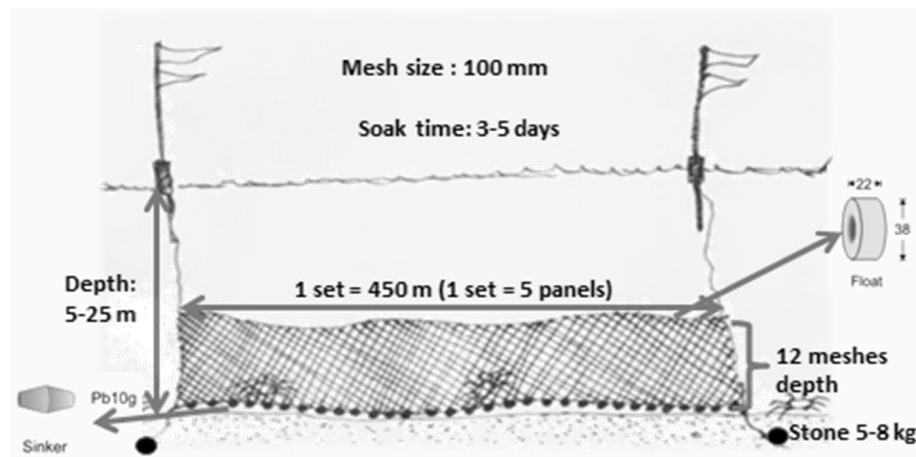


## Study on bycatch and discards of bottom crab gillnet targeting blue swimming crab (*Portunus pelagicus*) in Rayong province, THAILAND

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### Introduction

Crab gillnet targeting blue swimming crab (*Portunus pelagicus*) is a small scale traditional fishing gear that operates on seabed which the most widely used in Rayong province, Thailand. The net made from nylon monofilament (PA, mesh size 100 mm, 12 meshes depth, 450 meshes in horizontal/net). They are operated about 3-5 sets/day/fisher. The head rope made from polyethylene (PE) z twisted (dia. 3 mm, 2 ropes, length 450 m/set). The float is plastic (38×10 mm). The sinker rope is from polyethylene z twisted (dia. 4 mm, 1 rope, length 450 m/set). The sinker is lead (weight 10 g/lead). Hanging ratio of the net about 50% . The stone weights at the both side ends are about 5-8 kg. The net structure and net during operation shown in Fig 1.



**Figure 1** A set of bottom gillnet in Rayong province, THAILAND

Generally the crab gillnet fishing operates in early morning in the fishing ground of 5-25 m depth with the soaking time of 3-5 days. It operates at sea bottom, target species is blue swimming crab. According to fisheries statistics of Thailand (Department of fisheries, 2012) reported that in year 2010 Thailand caught the blue swimming crab 22,800 tons in total, with the value of 2,520.7 million baht. The crab is very important economic for fishers. They have high price, about 100-300 baht/kg, depends on the crab size and season. However the crab gillnet can catch not only blue swimming crab but also other marine species which many of them become discards species. Puntip et al. (2013) surveyed the diversity of crabs from bottom gillnet, Rayong province, The species of crabs collected from bottom gill net at Banpae, Suanson and Makampom Bay in Rayong province were totally 83 species. The species richness in each station, Banpae, Makampom Bay and Suanson were 65, 52 and 48 species, respectively. The species of crabs as trash fish (discarded) was quite high comprising 81.93 % of total numbers of caught species. The fishers actually do not want to catch non- marketable value or undersize species. In order to reduce the bycatch and discards and protect the marine species, besides to find the possibility methods to reduce the discards species, this study was done to understand the catch species, catch compositions, bycatch and discards from this fishery.

## Materials and Methods

Onboard data collecting with a crab gillnet fisher around Mea Rumphueng beach, Rayong province in the fishing ground of 5-23 m depth, the tracking by portable GPS (eTrex 30) during on 3 October 2014 were conducted. The catch from onboard survey was recorded. The catch species were identified, counted and weighted. Catch compositions were analyzed both in percent by number and percent by weight. The target species was calculated as catch per unit effort (CPUE) by weight. Discard ratio, discard rate by number and by weight were estimated by using the method of Alverson et al. 1994, as follow;

$$\text{Discard Ratio} = \text{Discards/Retentions}$$

$$\text{Discard Rate} = \text{Discards}/(\text{Retentions}+\text{Discards})$$

We observed the discards and asked the reasons why they were discarded species from the fisher.

## Results Discussion

CPUE of blue swimming crab as the target was 4.97 kg/set in 3 October 2014, through the onboard survey, 13 species in total were listed as bycatch with the discards (Table 1)

**Table 1** the catch, discard ratio and discard rate from Rayong crab gillnet (1 set) on 3 Oct 2014

No.	Scientific Name	Catch		Discard ratio by		Discard rate by	
		number	weight(g)	number	weight(g)	number	weight(g)
<b>Target species (Retained)</b>							
1	<i>Portunus pelagicus</i>	41	4,970	-	-	-	-
<b>Bycatch (Retained)</b>							
1	<i>Thenus orientalis</i>	4	400	-	-	-	-
<b>Bycatch (Discarded)</b>							
1	<i>Parthenope longimanus</i> *	69	1,600	1.53	0.29	0.30	0.09
2	<i>Dorippe quadridens</i> *	35	1,200	0.77	0.22	0.15	0.07
3	<i>Dromidiopsis sp.</i> *	22	2,200	0.49	0.40	0.09	0.13
4	<i>Calappa clypeata</i> *	8	200	0.17	0.03	0.03	0.01
5	<i>Galene bispinosa</i> **	8	200	0.17	0.03	0.03	0.01
6	<i>Demania scaberrima</i> ***	3	200	0.06	0.03	0.01	0.01
7	<i>Lutjanus johnii</i> ***	2	190	0.04	0.03	0.00	0.01
8	<i>Alectis indicus</i> ***	1	150	0.02	0.02	0.00	0.00
9	<i>Inegocia japonica</i> **	1	40	0.02	0.00	0.00	0.00
10	<i>Murex trapa</i> ***	1	10	0.02	0.00	0.00	0.00
11	<i>Spondylus sp.</i> **	30	1,700	0.66	0.31	0.13	0.10
12	Others (Coral)		3,000		0.55		0.18
	Total	225	16,460	4.00	2.06	0.74	0.61

Reason: \*non-marketable, \*\*too few catch, \*\*\* too small size

From the catch compositions, the blue swimming crab was caught only about 31% by weight (Fig 2) while 69% was the others that become bycatch and discard species. From 3 October 2014 fishing operation, the fisherman retained only 2 species. There were blue swimming crab and flathead lobster. The discards analysis results as other species were discarded.

By number, Discard ratio = 4.00, Discard rate = 0.74

By weight, Discard ratio = 2.06, Discard rate = 0.61

The discard ratio by weight from operation was 2.06, it means when fisherman to retained the catch 1 kg/set the other discards will be caught about 2.06 kg/set. The catches of white long-armed crab was more by number but low weight because this species is too small size and seem to be this fishing ground is habitat for white long-armed crab. In order to reduce those discards species, the one of possible method is modifying this fishing gear such increasing the mesh size of nets. Increasing mesh size can release more small size catch especially the species that be caught with gilled characteristic (Anukorn et al, 2007). However the impacts of mesh size increasing on the catch of target species should be considered.

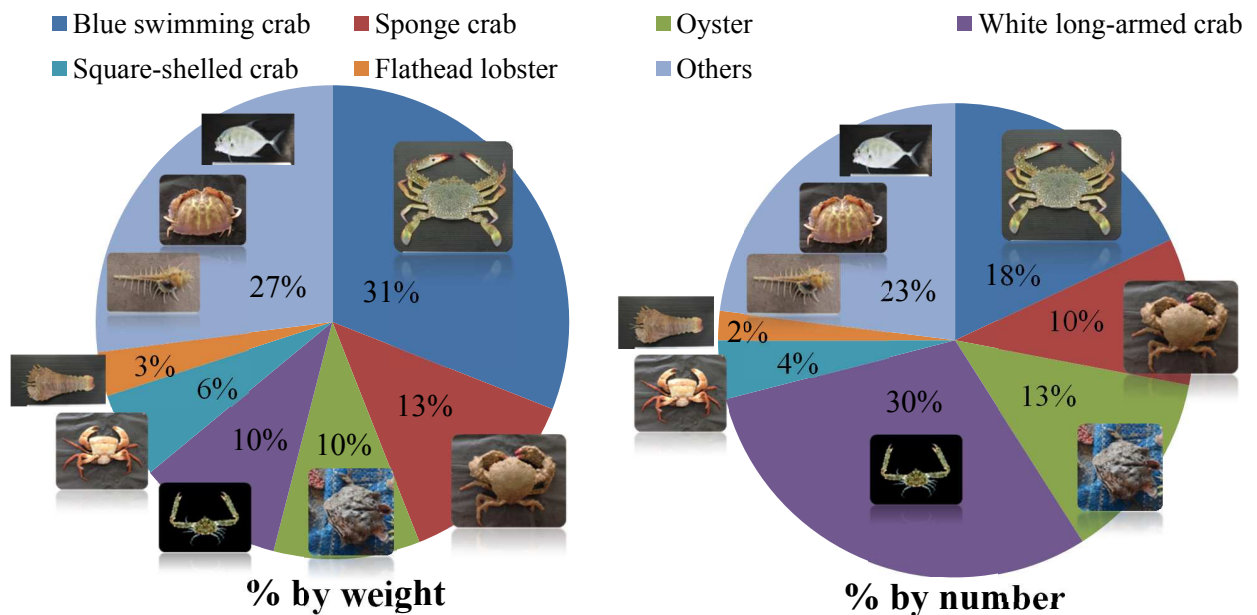


Figure 2 Catch compositions on 3 Oct 2014

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