TRAP FISHING FOR SPOTTED BABYLON, *BABYLONIA AREOLATA* LINK, 1807 (GASTROPODA) IN THE EASTERN GULF OF THAILAND

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ABSTRACT

Ban Phe District, Rayong province, has the largest commercial harvest of *Babylonia areolata* in the Eastern Gulf of Thailand. Snails are caught in traps, 35 x 40 x 30 cm, baited with mixed trash fish and portunid crabs. Four fishing boats, carrying 60 traps each, were monitored at intervals during February to May 1996. The catch of *B. areolata* ranged from 0-9 snails per trap with an average catch of 0.9 snail per trap. Average snails measured 69.0 mm in length, 42.6 mm in width and weighed 46.7 g, shell included. The normal market price was 180 baht per kg snail. The catch was estimated at approximately 108 kg per boat per month corresponding to a gross income of 19,440 baht. Net income was 9,105 baht per month (ca. 365 US$). In addition, 11 species of by-catch were captured by the babylon traps.

INTRODUCTION

Spotted babylon, *Babylonia areolata*, commonly known as Hoy Wan in Thailand, is an important commercial marine gastropod. It is abundant in the Gulf of Thailand, especially in muddy sand areas not exceeding 5-10 m in depth. The species spawns all year round with minimum and maximum peaks in November and March respectively. The average spawning time is 6.5 d per month. Size and age at maturity are 40.0 mm and 1 year respectively (Singhagraiwan 1996). Eggs contained in capsules are laid on muddy sand substrata, and embryos develop inside the capsules. Larvae emerge as planktonic veligers which metamorphose within 18 days after hatching. The metamorphosed larvae are benthic and spend most of their time mobile and half-buried in the sand. They move when offered a prey or confronted with a predator (Chaitanawisuti & Kridsanapuntu 1997). The marketable size of spotted babylon, 6.0 cm in shell length, was 180-200 baht per kg wet weight, or about 8 US$ at the time of the study. The *Babylonia* fishery, a relatively small-scale fishery, is primarily carried out on natural beds in eastern and southern parts of Thailand (Panichasuk 1996). Direct fishery of this species recently developed by means of baited-trap fishing carried out all year round. The nature of this fishery is very similar to that of sand crab (*Portunus pelagicus*) trap fishery. Traps are baited with dead fishes or crabs and hauled at regular intervals. This fishery has provided an economic supplement to specialised small scale fisheries for squid and sand crab. In addition, a directed fishery has recently developed for babylon and the economic viability of the seafood market has increased rapidly.

MATERIALS AND METHODS

Trapping sites

The largest *B. areolata* harvest in the inner part of the Eastern Gulf of Thailand comes from the well known fishing ground in Ban Phe District, Rayong province. The sea bed is mostly muddy sand at depths of 5-15 m, 3-7 km from the shoreline. Sea water temperature and salinity range from 28.0-29.5 °C and 29-30 ‰ respectively.

Trapping operation

The babylon trap is made of a 35 cm x 40 cm x 30 cm rectangular iron frame covered with nylon polyethylene net, 2.5 cm mesh size.

Table 1. Summary of production, capital and operation costs, and price for *B. areolata* fishing.

Capital costs (baht)	
Trap construction (60 traps) (70 baht each, minimum 1 year of use)	350
Small boat with engine (10.000 baht each, more than 5 years of use)	165
Operating costs (baht):	
Bait (per month)	3,000
Fuel (per month)	720
Labour (per person/month)	4,100
Equipment, repair, and maintenance (per month)	2,000
Total monthly costs	10,335
Production:	
Average production (kg/day)	3.6
Estimated minimum production per month in kg	108
Sales price:	
Sales price (baht per kg)	180
Income:	
Income (baht per month)	19,440
Net income (baht per month)	9,105

There are two entrances. Each trap is attached to a nylon rope and floating drum. Snails enter the trap by crawling up the sides. They fall through a square opening while seeking for the bait composed of a mixture of dead carangid fish, *Selaroides leptolepis*, and sand crab, *Portunus* sp. Bait is stored inside a bag made of polyethylene net suspended by rope and twine midway between top and base of the trap.

Traps were baited and set in the late afternoon. The soaking time was 12 h since *B. areolata* are nocturnal. The traps were placed on the sea floor with an average distance of 12-15 m between traps. The line was always perpendicular to the prevailing tidal current. In general, one local fishing boat, 4 m long, can carry about 60 traps. In the present study, traps were monitored twice a month from February to April, 1996. Average total catch rate and catch per trap were calculated. Shell length and body weight of each snail were recorded, and all by-catch captured by trap was noted.

Financial analysis

The economic components of babylon trap fishing are analysed. The capital costs are trap construction, boat, and engine. Operation costs are bait, fuel, labour, equipment repair, maintenance, and miscellaneous. Based on the estimated harvest and average market price, the monthly income is calculated.

RESULTS

Catch and value

The catch rate of *B. areolata* ranged from 0.5-1.6 snails per trap with an average weight of 51.9 g per trap per day. Average snails measured 69.0 mm in length, 42.6 mm in width, and weighed 46.7 g.

On average, the total weight was 3.6 kg caught in the 60 traps employed per boat cruise. This was equivalent to an average income of 648 baht per cruise at the normal market price of 180 baht per kg. Based on this average, the catch can be estimated at 108 kg per month, or a gross monthly income of 19,440 baht.

Eight species of by-catch were captured consisting of 5 economically important species; sand crab (*Portunus pelagicus*), stout-spine murex (*Murex trapa*), sea urchin (*Salmocis* sp.), sea horse (*Hippocampus* sp.), juvenile grouper (*Epinephelus* sp.) and 3 economically unimportant species; heart urchin (*Maretia* sp.), starfish (*Astropecten* sp.), and

starry triggerfish (*Abalistes stellaris*).

Financial analysis

The economic components of babylon trap fishing are presented in Tab. 1. The capital costs, operation costs, and gross income resulted in an estimated net income of 9,105 baht per month.

DISCUSSION

The catch rate was variable, ranging from 31-112 snails per cruise. However, trap fishing of *B. areolata* can provide an economic supplement to specialised small scale fisheries. All snails captured were of adult size, mostly 6-7 cm in shell length, and very few of smaller sizes were found. Snails were distributed through-out the fishing areas due to migration of this species.

Catch rates have recently declined in traditional areas probably because of continuous yearly exploitation of natural stocks, particularly in the larger size classes. The market price increased in response to decreased landings. Decreasing natural stocks have also led to an increased attention towards a possible alternative to trap fishing. Establishment of babylon mariculture has been considered as a means of preventing overfishing. Aquaculture and restocking could further increase the marketable supply (Chaitanawisuti & Kridsanapuntu 1997).

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