

APPLICATION OF THE ABUNDANCE OF MUD CRAB *Scylla* spp. AS AN INDICATOR TO ASSESS THE MANGROVE FOREST IN CHUMPHON PROVINCE, THAILAND

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Introduction

Mangrove forest situated along Thungmaha Bay, Chumphon Province has an area of about 10 km². The mangrove has been important as habitat for fisheries resources and has been vital to the livelihood of local people in the community for a long time. The community can earn a living by catching fish and crabs to provide food and income. The majority of people living in Ban Phakklong occupied nearly all fisheries. In mangrove forest along the bay, mud crab fishery resources are important to the economy of another community. The current numbers of Phakklong crab fishing boat comprise about 15-20 boats, each boat with about 50-120 collapsible crab traps. Fishermen consider mud crab fishery secure due to income from selling crabs since the marketing price of crab is high and crabs are abundantly available to be caught almost daily throughout the year. Unfortunately mangrove forest has deteriorated due to destruction by storms and clear cutting for shrimp farming. The decline in mangroves has been accompanied by reduction in productivity, biodiversity and the economic value of artisanal and inshore fisheries, especially mud crab fisheries. This study therefore aimed to assess the significance of mangrove habitats using abundance of the commercially important mud crab *Scylla* spp., a top benthic predator and total benthic fauna as indicators of the ecological function of mangrove habitats. This will aid decision makers to make informed decisions for planning a sustainable fisheries management in the region.

Assessment of mangrove habitats

Two mangrove forests were selected as the study sites. The mangrove forest at Ban Phakklong (BPK) represents an intact healthy undisturbed forest whereas the mangrove forest at Ban Bosamrong (BBSR) represents a fragmented and deteriorated condition. Abundance of mud crab was estimated using catch per unit effort (CPUE) and abundance of benthic fauna (Walton *et al.*, 2006b). To assess the significance of mangrove habitats abundance of the commercially important mud crab *Scylla* spp. was used (Walton *et al.*, 2006a).

Results

The results showed that mud crab species, both *Scylla paramamosain* and *S. olivacea* were more abundant in the mangrove at BPK than at BBSR. However, *S. olivacea* was found to be dominant over *S. paramamosain* in the BPK mangrove, while *S. paramamosain* dominated at BBSR (Table 1). The factors that influenced higher abundance of both species at BPK compared to BBSR were the forest structure, soil structure and composition including food resources. At BPK, the mangrove contained more plant species than at BBSR thus making BPK a more suitable habitat for mud crabs. Soil at BPK had more silt particles than sand particles, while at BBSR sand particles dominated and soil at BPK also contained higher amounts of organic matter, nitrogen and phosphorus (Table 2). Moreover, the density and diversity of benthic prey, especially the crustaceans, for mud crabs was found to be higher at BPK (Table 3).

Table 1 Comparison of *Scylla* spp. abundance between Ban Phak Klong and Ban Bosamrong mangrove. * indicates results significantly different p

Season	Ban Phak Klong (BPK)			Ban Bosamrong (BBSR)		
	<i>S. paramamosain</i>	<i>S. olivacea</i>	Total	<i>S. paramamosain</i>	<i>S. olivacea</i>	Total
Dry season	14.46±1.59	14.11±0.99	28.57±9.40	8.96±0.95 *	11.48±1.33	20.44±1.15
Wet season	16.00±1.38	24.82±1.48 *	40.82±1.90 *	13.11±0.68 *	10.07±0.54	23.18±0.86 *

Table 2 Nutrient concentrations in sediment in dry season and wet season at Ban Phak Klong and Ban Bosamrong mangrove

Nutrients	Ban Phak Klong		Ban Bosamrong	
	Dry season	Wet season	Dry season	Wet season
Organic matter (%)	3.05±0.23	3.15±0.16	1.47±0.11	1.87±0.17
Total nitrogen (%)	0.14±0.01	0.18±0.01	0.06±0.00	0.08±0.01
Total phosphorus (ppm)	9.44±7.17	41.22±5.03	4.09±0.70	4.97±0.65

Table 3 Species composition and density of benthic fauna at Ban Phakklong and Ban Bosamrong mangrove forest

Benthic fauna	Ban Phakklong		Ban Bosamrong	
	Dry season	Wet season	Dry season	Wet season
Family Grapsinae	2.36	10.71	2.00	3.00
Family Ocypodidae	0.00	6.14	0.00	0.11
Family Assimineidae	0.00	8.50	0.00	0.00
Family Ellobiidae	6.50	3.65	0.00	0.00
Family Littorinidae	16.99	1.69	21.38	13.63
Family Muricidae	0.50	0.25	0.00	0.00
Family Neritidae	2.00	0.00	0.00	0.00
Family Potamididae	4.34	10.1	2.00	7.25
Family Ranellidae	1.00	0.33	0.00	0.00
Total density	33.69	41.37	25.38	23.99

It can be concluded that abundance of mud crab and density of benthic fauna as prey were more abundant in the mangrove at Ban Phakklong than at Ban Bosamrong. Therefore, to conserve and maintain the availability of mud crab resources of Thungmaha Bay, there should be increasing reforestation and rehabilitation of the mangrove forest for sustainable fisheries resources management.

References

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