

## MONITORING OF PLANKTONIC LARVAE OF GREEN MUSSEL, *PERNA VIRIDIS* (LINNÉ) IN SI RACHA BAY, THAILAND

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### ABSTRACT

Larvae of green mussel, *Perna viridis* (Linné) were monitored in the culture area of Si Racha Bay, Chonburi Province to estimate the best time to collect spat needed for suspended culture. Green mussel larvae were collected by plankton net every two weeks from July 1996 to June 1997. Green mussel larvae occurred almost throughout the year, but the highest numbers appeared in the beginning of March 1997, and two other peaks in September to October 1996 and December 1996 to January 1997.

### INTRODUCTION

Culture of green mussel *Perna viridis* (Linné), using the hanging method, was performed at Si Racha Bay, Chonburi province, the Gulf of Thailand for demonstration to the local fishermen. The first step was to provide natural seed from the sea. Since a large number of green mussel spat is needed, the seed collection should be done at the appropriate time. It is well established that the spawning stage of green mussel can be checked by histological studies, but it needs some technique and time. Therefore, monitoring of green mussel larvae in the culture area was applied as an alternative method to detect periods of spat fall.

### MATERIALS AND METHODS

Shell morphology of planktonic larval stages of green mussel were studied based on specimens cultured in the laboratory. The characters of hinge structures were observed by separating the two valves from each other and from the soft parts, by immersing the larvae in a 10 % sodium hypochlorite solution (Rees 1950). The ratio of shell length and shell height from 30 specimens of each stage: D-shaped stage, umbo stage, and eyed larvae stage were recorded. The measurement was done under light microscope equipped with micrometer. Shell length is defined as the longest distance in a direction roughly parallel to the hinge. The shell

height is the distance from the top of the umbo to the ventral margin.

Zooplankton around the culture area in Si Racha Bay were hauled obliquely every two weeks from July 1996 to June 1997. The diameter of the plankton net is 30 cm with a 70  $\mu$ m mesh size. The samples of collected zooplankton were investigated under light microscope for green mussel larvae using a counting chamber slide. The number of the green mussel larvae from each slide, including measurements of shell length and shell height of each larva, was recorded. Green mussel larvae were identified on hinge structure, shell shape, and the ratio of shell length to shell height.

### RESULTS

#### *Morphological features*

Laboratory culture of the green mussel provided 4 developmental stages of planktonic larvae: trochophore, D-shaped or straight-hinge stage, umbo stage, and eyed larvae. Newly hatched larvae are trochophores without larval shell. They develop into the D-shaped stage which is rather elongated from the anterior to the posterior end. The umbo stage and eyed larvae are almost rounded in shape. The posterior end is round and the anterior margin somewhat pointed. The shell size and number of hinge teeth are shown in Tab. 1.

Table 1. Shell length (SL), ratio of shell length and shell height (SL:SH), and number of hinge teeth of planktonic larvae of green mussel.

Larval stage	SL ( $\mu\text{m}$ )	SL:SH	No. of hinge teeth
D-shaped	80 - 120	1.25:1 - 1.50:1	15 - 16
Umbo stage	100 - 280	1.13:1 - 1.21:1	16 - 18
Eyed larvae	250 - 350	1.08:1 - 1.13:1	16 - 18

#### Number of green mussel larvae in culture area

A total of 22 samples of zooplankton were collected from the culture area in Si Racha Bay. Three planktonic stages of green mussel were identified: D-shaped stage, umbo stage, and eyed larvae. The amount of larvae from each collection was calculated as number of larvae per ton of sea water. The highest peak of occurrence appeared at the beginning of March amounting to 17,006 individuals  $\text{m}^{-3}$ . Two smaller peaks occurred during middle of September to the beginning of October and from the middle of December to January. The amount of green mussel larvae estimated in the study area is shown in Fig. 1.

#### DISCUSSION

The present study agrees with Chongpeepien (1980) who studied the reproductive cycle of green mussels in Chachoengsao province, located in the Gulf of Thailand, and close to Si Racha Bay, Chonburi province. She reported that about 70 % of the spawning of green mussel occurred in January, and about 90 % in February. The larvae are planktonic for two weeks after spawning, so a high number of planktonic larvae should be found in March as found during the present monitoring. This method is considered to be a convenient technique to indicate when it is time for the fishermen to put out spat collectors for green mussels.

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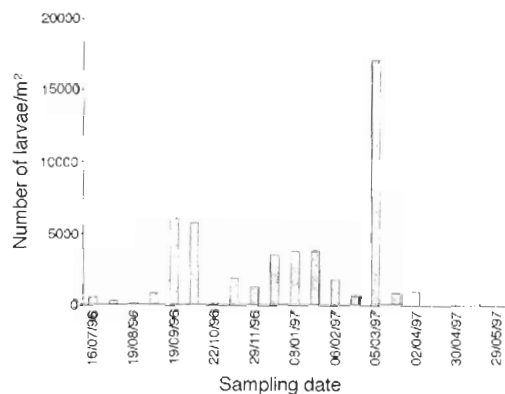


Figure 1. Number of planktonic larvae of green mussel in Si Racha Bay, July 1996 to June 1997.

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