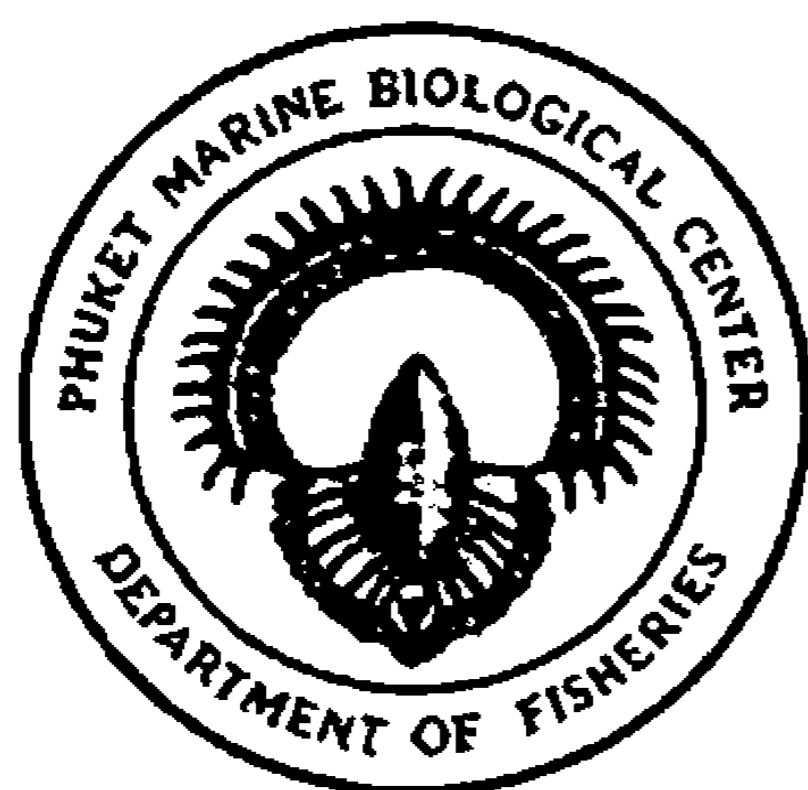


## Effects of ecological variation in two estuaries on growth and survival of the clam *Meretrix* sp., northern Java.

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*Meretrix* sp. were collected monthly within quadrats in two estuaries at Jepara and Tayu, northern Java.

Data on length, width and weight were used to compare growth patterns. The growth coefficients  $K$  were rather different (0.300 in Tayu against 0.364 in Jepara). Survival during desiccation was tested at room temperature (25 °C). Clams from Jepara estuary tolerated aerial exposure better ( $LT_{50} = 132$  h) than clams from the Tayu estuary ( $LT_{50} = 108$  h). The concentrations of lead and copper were measured in sediments. The levels were low in both estuaries.

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### INTRODUCTION

*Meretrix* sp. have thick ovate shells, posterior margins longest and somewhat flattened. Umbones are large, inflated, located slightly towards the anterior end. External surface of shell is smooth, colour variable from whitish, grey to black brownish; interior white, pallial sinus deep (Nateewathana 1995).

Venerid clams of the genus *Meretrix* are free living burrowing molluscs inhabiting surf beaten sandy shores or sandy and muddy bottom of bays, estuaries and brackish water (Bal & Rao 1984). They grow up to 75 mm, weigh nearly 40 g (Bal & Rao 1984), and live in salinities of 10-30 ‰ with optimum between 20 and 26 ‰ (Nie 1991; Pillay 1993). They can tolerate anoxic or hypoxic conditions. During prolonged aerial exposure, bivalves suppress their metabolic rate and their metabolic processes become predominantly anaerobic (Eertman & de Zwaan 1994). Theede *et al.* (1969) showed a perturbing effect of chemical compounds dissolved in sea water on energy metabolism, which was expressed by a

decreased tolerance to anoxia. In areas where access to oxygen strongly fluctuates (e.g. intertidal and strongly eutrophicated zones), the success or failure of populations may (partly) rely on their ability to survive anoxic conditions. Hence, studies of ecological variations in two different estuaries will give a holistic evaluation of the species *Meretrix* sp. and how the environment affects their natural growth and tolerance to air exposure.

### MATERIAL AND METHODS

Field work was conducted one time each month during June, July and August 1999 in two estuaries of Jepara and Tayu, Central Java. *Meretrix* sp. were collected from ten randomly placed quadrats (1 x 1 m). Clams found in each square were kept separate, counted and measured. Natural growth of *Meretrix* sp. was estimated using von-Bertalanffy growth equation (with ELEFAN software) using the shell length (Pauly 1984). We used the formula  $L(t) = L [1 - e^{-K(t-t_0)}]$ , where:  
 $L(t)$  = length at time  $t$