Thesis Title ULTRASTRUCTURE OF THE EGG ENVELOPE OF Macrobrachium rosenbergii de Man DURING ITS DEVELOPMENT FROM FERTILIZATION TO HATCHING

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ABSTRACT

The envelope of the fertilized egg of Macrobrachium rosenbergii de Man were observed under transmission and scanning electron microscopy. Eggs at different stages from fertilization to hatching (day 19) were freshly obtained from the female prawn. At the beginning the egg contains envelope 1 which is composed of the outer 1A and inner 1B layers. Layer 1B is swollen within the first two hours at which time the envelope 2 starts forming. Formation of the envelope 2 is characterized by releasing of four types of vesicles from the ooplasm: high-density vesicles, moderate dense vesicles, low-density vesicles, and ring vesicles. The expansion of the layer 1B lasts for a few hours and is followed by its condensation. The envelopes 1A, 1B, and 2 afterward maintain their position and shapes and superimpose to newly secreted successive envelopes up to the end of embryogenesis. The envelope 3 is formed

at 12 hours postfertilization and characterized by releasing of vesicles containing smooth membrane. At full development, it is composed of the outer refringent and inner granular layers. The envelope 4 is formed at day 3 of embryogenesis. At complete formation, it is highly folded and becomes succesive ridges covering the whole surface of the embryo. The envelope 5 begins its formation around day 14 of embryogenesis by fusion of substances released from the outermost cells of the embryo. All of these five envelopes maintain their positions throughout the whole course of embryogenesis and the last one becomes cuticle of the hatching larva. This study clearly indicates that embryonic molting cycles occur in the fertilized egg of M. rosenbergii, a phenomenon that is commonly observed in many crustaceans.