



- 9 SEP 1992

**THE ULTRASTRUCTURE OF COELOMIC SAC OF GIANT FRESHWATER PRAWN,
Macrobrachium rosenbergii de Man**

NAOVARAT KURUCHAROEN

อนันต์นากการ

๑๓

*Submitted to the Faculty of Graduate Studies
Mahidol University*

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE
(ANATOMY)**

IN

FACULTY OF GRADUATE STUDIES

MAHIDOL UNIVERSITY

1992

Copyright by Mahidol University

19568

มิด แล้วตรวจดูการกระจายของสารนี้ใน เบสเมนต์ เมมเบรน พบว่า PEI กระจายสม่ำเสมอส่วนประกอบที่เป็นประจุลบในเบสเมนต์ เมมเบรน อย่างเป็นระเบียบตลอดความหนาของ เบสเมนต์ เมมเบรน ผลการทดลองนี้แสดงว่า กุ้งซีโลมิดของกึ่งก้ำมกรานั้น แม้ว่าจะมีลักษณะของอวัยวะคล้ายโคที่ไม่เจริญเต็มที่แบบ สัตว์ชั้นต่ำ ก็ยังอาจจะมีบทบาทในการทำงานที่เกี่ยวข้องกับการกรองสารที่มีประจุ ได้



Thesis Title The Ultrastructure of Coelomic Sac of
Giant Freshwater Prawn, Macrobrachium
rosenbergii de Man

Name Naovarat Kurucharoen

Degree Master of Science (Anatomy)

Thesis Supervisory Committee

 Vijitra Leardkamolkarn, Ph.D.
 Boonsirm Withyachumnarnkul, M.D., Ph.D.
 Praneet Damrongphol, Ph.D.

Date of Graduation 30 June B.E. 2535 (1992)

ABSTRACT

This study was aimed to demonstrate the finely detailed morphology of coelomic sac of Macrobrachium rosenbergii de Man by using light microscopy, scanning electron microscopy and transmission electron microscopy. Adult prawns were maintained in recirculating water and fed with mussels for 2-3 days before sacrificed. Twenty antennal glands were dissected after being perfused with fixative. After routinely processed, the surface morphology of the coelomic sac was examined, under scanning electron microscope (SEM). Forty antennal glands were prepared and processed, for ultrastructural study by transmission electron microscopy (TEM).

As revealed by LM and SEM, the coelomic sac contained clusters of undifferentiated cells at the outer cortex whereas cells in the inner region were more differentiated. The inner cells possess numerous foot processes adhering to the basement membrane. Under TEM, the coelomic

sac in the inner cortex region showed morphologic arrangement resemble to what have been observed in immature mammalian glomerulus, except that no endothelial cells were present.

To further determine whether the basement membrane of Macrobrachium rosenbergii de Man's coelomic sac cells contains the same constituents as those known components found in the vertebrate glomerular basement membrane, polyethyleneimine (PEI) was used as an anionic probe for the site-distribution in the basement membrane. After perfusion of PEI into the antennal glands, the glands were briefly immersed in PEI. The tissues were processed for TEM study. PEI electron-dense particles were found evenly distributed throughout the whole thickness of the basement membrane. The staining was negative, however, on the cell surface or slit diaphragm.

The results suggest that coelomic sac of Macrobrachium rosenbergii de Man, although seems primitive, may function as charge-selective barrier for filtering molecules in the hemolymph.