

## **Region-Specific Secretory Protein, $\alpha$ 2M, in Male Reproductive Tract of the Blue Crab And Its Dynamics during Sperm transit towards Female Spermatheca**

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**Abstract :** In this study, we characterized a region-specific 250 kDa protein that was secreted of MSD fluid, which is believed to play dual functions in forming a spermatophoric wall for sperm physical protection, and in sperm membrane modification as part of sperm maturation process. The partial amino acid sequence and N-terminal sequencing revealed that the MSD-specific 250 kDa protein showed a high similarity with a plasma-rich protein,  $\alpha$ -2 macroglobulin ( $\alpha$ 2M), so termed pp- $\alpha$ 2M. This protein was a large glycoprotein contained predominantly mannose and GlcNAc. The expression of pp- $\alpha$ 2M mRNA was detected in spermatid duct (SD), androgenic gland (AG) and hematopoietic tissue, while the protein expression was rather specific to the apical cytoplasm of MSD epithelium. The secretory pp- $\alpha$ 2M in MSD fluid was acquired onto the MSD sperm membrane and was also found within the matrix of the acrosome. Distally, pp- $\alpha$ 2M was removed from spermathecal sperm membrane, while its level kept constant in the sperm AC. Together the results indicate that pp- $\alpha$ 2M is a 250 kDa region-specific secretory protein which plays roles in sperm physical protection and also acts as maturation factor in the *P. pelagicus* sperm.

**Keywords :** alpha-2 macroglobulin, blue swimming crab, sperm maturation, spermatid duct

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