Accepted Manuscript

Molecular characterization of minichromosome maintenance protein (MCM7) in *Scylla paramamosain* and its role in white spot syndrome virus and *Vibrio alginolyticus* infection

Fei Zhu, Xiyi Qian, Ziyan Wang

PII: S1050-4648(18)30572-2

DOI: 10.1016/j.fsi.2018.09.028

Reference: YFSIM 5549

To appear in: *Fish and Shellfish Immunology*

Received Date: 31 May 2018

Revised Date: 3 September 2018

Accepted Date: 7 September 2018

Please cite this article as: Zhu F, Qian X, Wang Z, Molecular characterization of minichromosome maintenance protein (MCM7) in *Scylla paramamosain* and its role in white spot syndrome virus and *Vibrio alginolyticus* infection, *Fish and Shellfish Immunology* (2018), doi: 10.1016/j.fsi.2018.09.028.

Molecular characterization of Minichromosome maintenance protein (MCM7) in *Scylla paramamosain* and its role in white spot syndrome virus and *Vibrio alginolyticus* infection

Fei Zhu*, Xiyi Qian, Ziyan Wang

College of Animal Science and Technology, Zhejiang Agriculture and Forestry University, Hangzhou 311300, China

* Corresponding author: Dr. Fei Zhu

Tel: 86-571-88981127

Fax: 86-571-88981127

Email: zhufei@zju.edu.cn

Abstract

The minichromosome maintenance protein (MCM7) is a member of the MCM protein family which participates in the MCM complex by playing a role in the cell replication cycle and chromosome initiation in eukaryotes. The 2270 bp cDNA sequence of *MCM7*, including a 2127-bp open reading frame (ORF) encoding a 709-aa protein, was cloned from *Scylla paramamosain* using RT-PCR and RACE. Data showed that *MCM7* was highly expressed in the digestive organ and hepatopancreas of *S. paramamosain*. Furthermore, *MCM7* expression was down-regulated by infection with white spot syndrome virus (WSSV) or *Vibrio alginolyticus*. When *MCM7* was knocked down, immune genes such as Janus kinase (JAK) and crustin antimicrobial peptide (CAP) were down-regulated, and C-type-lectin (CTL) was up-regulated in hemocytes. The mortality of WSSV-infected or *V. alginolyticus*-infected crabs was enhanced following *MCM7* knockdown. It was demonstrated that *MCM7* is very important in the progression of WSSV and *V. alginolyticus* infection. We also investigated the effect of *MCM7* on apoptosis rate and phagocytic rate in *S. paramamosain*. *MCM7* knockdown caused higher levels of apoptosis in the hemocytes of the control, WSSV, and *V. alginolyticus* groups. *MCM7* knockdown influenced the activity of phenoloxidase (PO) and superoxide dismutase