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Molecular characterization of shrimp harbinger transposase derived 1 (HARBI1)-like and its role in white spot syndrome virus and *Vibrio alginolyticus* infection

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Abstract

The role of the nuclease, HARBI1-like protein (mjHARBI1-like) in the innate immunity of *Marsupenaeus japonicus* was explored in this study. The 1361 bp cDNA sequence of mjHARBI1-like was cloned from *M. japonicus* using RACE. RT-qPCR analysis results showed that the gills and hepatopancreas of *M. japonicus* were the main tissues where mjHARBI1-like is expressed. In addition, it was also found that white spot syndrome virus (WSSV) or *Vibrio alginolyticus* challenge could stimulate mjHARBI1-like expression. After mjHARBI1-like was inhibited, expression of immune genes such as toll, p53, myosin, and proPO were significantly downregulated ($P<0.01$). However, in shrimp hemocytes, hemocyanin and tumor necrosis factor- α (TNF- α) were up-regulated significantly ($P<0.01$). This study demonstrated that mjHARBI1-like plays a key role in the progression of WSSV and *V. alginolyticus* infection. Specifically, the cumulative mortality of WSSV-infected and *V. alginolyticus*-infected shrimp was significantly advanced by double-strand RNA interference (dsRNAi) of mjHARBI1-like. Apoptosis studies indicated that mjHARBI1-dsRNA treatment caused a reduction in hemocyte apoptosis in bacterial and viral groups. In addition, phagocytosis experiments illustrated that

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