Molecular cloning and expression of peptidoglycan recognition protein (PGRPs) gene from freshwater mussel *Hyriopsis cumingii*

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ABSTRACT Peptidoglycan recognition proteins (PGRPs) are innate immune molecules which are structurally conserved through evolution in both invertebrate and vertebrate animals. In this paper, we reported the identification and characterization of two short (HcPGRP-S1 and HcPGRP-S2) and a long (HcPGRP-L) forms of PGRP from freshwater mussel *Hyriopsis cumingii*. The deduced amino acid sequences of HcPGRP-S1, HcPGRP-S2 and HcPGRP-L encoded 218, 285 and 420 amino acids, respectively, and contained the conserved PGRP domain. The multiple sequences alignment showed that the amino acids sites which could bind with Zn^{2+} and maintain amidase activity were partly conserved in HcPGRP-S1 and HcPGRP-L, but highly conserved in HcPGRP-S2. Real-time quantitative PCR analysis showed that the trend of expression patterns were from high to low in hepatopancreas, gill, mantle, adductor muscle and hemocytes of *H. cumingii*. The highest level of expression quantity of HcPGRP-S1, HcPGRP-L and HcPGRP-S2 mRNA in hepatopancreas was 6.61, 11.29 and 4.95 times as the lowest level of expression quantity in hemocytes, respectively. After PGN and *Aeromonas hydrophila* stimulation, the expression of these genes had significant difference in tissues of hepatopancreas, hemocytes and gill except for HcPGRP-L in hemocytes. These results suggested HcPGRP could involved in the immune recognition of *H. cumingii* and against gram-negative bacteria infection.

Keywords: *Hyriopsis cumingii*, PGRPs, Gene cloning, mRNA expression

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