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Short communication

Molecular cloning and expression of chitin deacetylase 1 gene from the gills of *Penaeus monodon* (black tiger shrimp)Katreena P. Sarmiento^{a, b}, Vivian A. Panes^b, Mudjekeewis D. Santos^{a, *}^a Genetic Fingerprinting Laboratory, National Fisheries Research and Development Institute, Mother Ignacia Ave., South Triangle, Quezon City, Metro Manila, 1103, Philippines^b Ateneo de Manila University, Katipunan Ave., Loyola Heights, Quezon City, Metro Manila, 1108, Philippines

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ABSTRACT

Chitin deacetylases have been identified and studied in several fungi and insects but not in crustaceans. These glycoproteins function in catalyzing the conversion of chitin to chitosan by the hydrolysis of N-acetamido bonds of chitin. Here, for the first time, the full length cDNA of chitin deacetylase (CDA) gene from crustaceans was fully cloned using a partial fragment obtained from a transcriptome database of the gills of black tiger shrimp *Penaeus monodon* that survived White Spot Syndrome Virus (WSSV) infection employing Rapid Amplification of cDNA Ends (RACE) PCR. The shrimp CDA, named *PmCDA1*, was further characterized by *in silico* analysis, and its constitutive expression determined in apparently healthy shrimp through reverse transcription PCR (RT-PCR). Results revealed that the *P. monodon* chitin deacetylase (*PmCDA1*) is 2176 bp-long gene with an open reading frame (ORF) of 1596 bp encoding for 532 amino acids. Phylogenetic analysis revealed that *PmCDA1* belongs to Group I CDAs together with CDA1 and CDA2 proteins found in insects. Moreover, *PmCDA1* is composed of a conserved chitin-binding peritrophin-A domain (CBD), a low-density lipoprotein receptor class A domain (LDL-A) and a catalytic domain that is part of CE4 superfamily, all found in group I CDAs, which are known to serve critical immune function against WSSV. Finally, high expression of *PmCDA1* gene in the gills of apparently healthy *P. monodon* was observed suggesting important basal function of the gene in this tissue. Taken together, this is a first report of the full chitin deacetylase 1 (CDA1) gene in crustaceans particularly in shrimp that exhibits putative immune function against WSSV and is distinctly highly expressed in the gills of shrimp.

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