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cDNA cloning and mRNA expression of a tandem-repeat galectin (PoGal2) from the pearl oyster, *Pinctada fucata*

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ABSTRACT. Galectins can recognize and specifically bind to β-galactoside residues, playing crucial roles in innate immune responses of vertebrates and invertebrates. We cloned the cDNA of a tandem-repeat galectin from the pearl oyster *Pinctada fucata* (designated as PoGal2). PoGal2 cDNA is 1347 bp long and consists of a 5'-untranslated region (UTR) of 3 bp, a 3'-UTR of 297 bp with one cytokine RNA instability motif (ATTTA), and an open reading frame of 1047 bp, encoding a polypeptide of 349 amino acids, with an estimated molecular mass of 38.1 kDa and a theoretical isoelectric point of 8.5. PoGal2 contains two carbohydrate recognition domains (CRDs); both have the conserved carbohydrate-binding motifs H-NPR and WG-EE. PoGal2 shares 50.6 and 50.9% identity with those of abalone (*Haliotis discus*) and the Manila clam (*Venerupis philippinarum*), respectively.

Phylogenetic analysis revealed that the tandem-repeat galectins formed two clades for the different species. Molluscan tandem-repeat galectins were clustered into a single clade, and nematode tandem-repeat galectins were clustered into another single clade. In both clades, CRD-N and CRD-C were divided into different groups. PoGal2 mRNA was constitutively expressed in all tissues analyzed, and the expression level of PoGal2 mRNA was found to be significantly up-regulated in digestive glands, gills and hemocytes after *Vibrio alginolyticus* stimulation/infection. Expression profile analysis showed that the expression level of PoGal2 mRNA was significantly up-regulated at 8, 12 and 24 h after *V. alginolyticus* infection. These results suggest that PoGal2 is a constitutive and inducible acute-phase protein involved in the innate immune response of pearl oysters.

Key words: *Pinctada fucata*; Pearl oyster; Lectin; β-galactoside; Innate immunity

