



Identification and expression analysis of the *Broad-Complex core protein isoform 6 (BR-C Z6)* gene in the giant tiger shrimp *Penaeus monodon* (Penaeidae: Decapoda)

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ABSTRACT. *Broad-Complex (BR-C)* is an early ecdysone-responsive gene encoding a family of zinc-finger transcription factors that function during metamorphosis in insects. We identified two full-length cDNAs of *BR-C Z6* in the giant tiger shrimp (*Penaeus monodon*). They were 2422 and 2060 bp in length, containing open reading frames of 1440 and 1443 bp, corresponding to polypeptides of 479 and 480 amino acids, respectively. Tissue distribution analysis indicated that *PmBR-C Z6* was abundantly expressed in hemocytes and ovaries in juveniles. In broodstock, *PmBR-C Z6* was constitutively expressed in all tissues

examined, and the highest expression was observed in ovaries. The expression of *PmBR-C Z6* in ovaries was significantly greater than in testes in both juveniles and broodstock of *P. monodon*. Quantitative real-time PCR indicated that the expression level of *PmBR-C Z6* was significantly down-regulated in stages II and III of ovaries in intact wild broodstock and returned to the basal level in stage IV ovaries and after spawning. In eyestalk-ablated broodstock, *PmBR-C Z6* was significantly up-regulated in stage IV (mature) ovaries. Moreover, the expression level of *PmBR-C Z6* in vitellogenic, early cortical rod and mature (stages II-IV) ovaries of eyestalk-ablated broodstock was greater than that of the same ovarian stages in intact broodstock. *In situ* hybridization revealed that *PmBR-C Z6* transcripts were localized in oogonia and cytoplasm of previtellogenic and vitellogenic oocytes of both wild intact and eyestalk-ablated broodstock. The effects of 20-hydroxyecdysone on expression of *PmBR-C Z6* were examined. The expression level of *PmBR-C Z6* in ovaries of juvenile *P. monodon* was significantly increased at 168 h post-injection. Taken together, these findings indicate that *PmBR-C Z6* plays an important role in ovarian development of *P. monodon*.

Key words: *Broad-complex*; Gene expression; *In situ* hybridization; Real-time PCR; RACE-PCR