

Abstract

Project Code : TRG5780296

Project Title : Identification and expression analysis of sex-related *Transformer-2* gene in giant river prawn, *Macrobrachium rosenbergii*

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Abstract:

The *Transformer-2* (*Tra-2*) gene is a member of the *Sxl-Tra/Tra-2-Dsx* pathway, which regulates the sex determination pathway in *Drosophila melanogaster*. In the present study, a homologue of *Tra-2* was identified in the giant river prawn (*Macrobrachium rosenbergii*). Two variants were isolated and characterized namely, *MrTra-2a* and *MrTra-2b*. Deletion of a 61-bp region from *MrTra-2b* caused a translational frameshift resulting in a shorter *MrTra-2b* protein. A conserved RNA recognition motif (RRM) was present in both isoforms of *MrTra-2* suggesting their functions in RNA-mediated processes similar to *Tra-2* in other species. The expression of *MrTra-2a* and *MrTra-2b* in adult tissues was ubiquitous. Neither sex- nor tissue-specific splicing of *MrTra-2* were detected in *M. rosenbergii*. Both *MrTra-2* variants were expressed in the male and female gonad without a sexually dimorphic pattern. The expression of *MrTra-2a* and *MrTra-2b* was detected at the first day after hatching and exhibited a dynamic expression profile during development with the highest expression from *MrTra-2b* in L3 and PL10 for the larval (L) and post-larval (PL) stages, respectively. In PL30, *MrTra-2b* and *MrSxl*—the gene at the top of the pathway—showed a significantly higher expression level over the *insulin-like androgenic gland factor* (*IAG*) gene of *M. rosenbergii*, whereas the opposite was evident in the juvenile stage and the androgenic gland. It is hypothesized that *MrTra-2*, together with *MrSxl*, plays a role in either initiating or regulating the expression of *MrIAG*, which is required for the sexual development in *M. rosenbergii*.

Keywords : *Transformer-2*; *Tra-2*; sex determination; *Macrobrachium rosenbergii*; giant river prawn