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Mr-Masc gene for sex-regulation and production of all-male populations in the giant freshwater prawn *Macrobrachium rosenbergii***Wen-ming Ma, Dong-rui Li, MS and Wei-jun Yang**
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Statement of the Background: *Macrobrachium rosenbergii* is one of the most important prawns in freshwater aquaculture. Male giant freshwater prawns grow faster and reach higher weights at harvest than females, which make the culture of all-male populations desirable. The purpose of this study is to explore the molecular information of new gene and its potential physiological function on sex regulation. Methodology & Theoretical Orientation: The gene expression pattern was studied using Real-time RT-PCR. The functional role of gene in vivo by RNA interference (RNAi) was utilized and its effect on sex regulation was evaluated. Findings: In this study, a novel gene of the full-length cDNA encoding a masculinizing factor from the giant freshwater prawn *Macrobrachium rosenbergii* was termed Mr-Masc. Real-time RT-PCR analysis revealed that Mr-Masc gene expression was obviously difference between male and female prawn, and dominantly expressed in the ovary of the reproductive tract in female prawn. To elucidate the functional role of Mr-Masc in vivo, the Mr-Masc gene was disrupted by RNA interference (RNAi). In vivo silencing of the gene, by injecting the all-male and monosex postlarvae with Mr-Masc double-stranded RNA, sex-reversed females (neofemales) were obtained. Moreover, all-male progeny was produced by mating neofemales with normal males and these all-male populations showed good growth potential and market value in the aquaculture. Conclusion & Significance: It was firstly reported the full and functional sex reversal of male freshwater prawns through the silencing of a single Mr-Masc encoding gene. Neofemales capable of mating and spawning were produced by the RNAi technology at a sufficiently early stage of larval development. This finding offered an insight regarding the biology and evolution of sex differentiation regulation. Since sexual dimorphic growth patterns are common among decapod crustaceans, it is obvious that the results of this study will have applied significance for many aqua cultured species.

Biography

Wen-ming Ma has expertise in sex determination and sex differentiation of the marine shrimp and prawn, functional gene discovery and application research. Meanwhile, make a good progress in sex control and all-male unisexual cultivation in *Macrobrachium rosenbergii*.

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