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Screening of genes related to ovarian development in the swimming crab, *Portunus trituberculatus*, by suppression subtractive hybridization

Z.B. Yu[1,2], C.K. Mu[1,2], W.W. Song[1,2], R.H. Li[1,2], Y.E. Chen[1,2] and C.L. Wang[1,2]

[1]School of Marine Science of Ningbo University, Zhejiang, Ningbo, China
[2]Collaborative Innovation Center for Zhejiang Marine High-efficiency and Healthy Aquaculture, Zhejiang, Ningbo, China

Corresponding author: C.L. Wang
E-mail: wangchunlin@nbu.edu.cn

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ABSTRACT. The swimming crab, *Portunus trituberculatus*, is an important marine animal and is widely cultured in China. In the present study, suppression subtractive hybridization was applied to identify the differentially expressed genes in the ovaries of mature and immature *P. trituberculatus*. One hundred and seventy six expressed sequence tag (ESTs) were identified, of which 100 were down-regulated, and 76 up-regulated. BLAST analysis identified 51 unigenes, of which 27 were down-regulated, and 24 up-regulated. Quantitative real-time reverse transcriptase polymerase chain reaction results indicated that the SSH technique is valuable in screening genes related to ovarian development. Genes identified in this study encoded proteins corresponding to a wide range of functions and included immune response protein, transcription initiation factor, metabolic proteins, chromosome, histone h3, ovarian development-related protein, and vitellogenin. In addition, 64 metabolic pathways were annotated in differentially expressed ESTs by using the

Kyoto Encyclopedia of Genes and Genomes pathway. Four annotated pathways (oxidative phosphorylation, carbon metabolism, fatty acid degradation, and protein digestion and absorption) appeared to be involved in ovarian development. In ontology analysis, 5.83% of the cellular process genes in reverse subtraction cDNA library are involved in reproduction, and 5.88% involved in developmental process. In up-regulated genes, myosin II-expressed polehole-like protein; histone h3; ovigerous-hair stripping substance; peritrophin 48; and ovarian development-related protein appeared to be involved in ovarian development. Identification of differentially expressed genes in the mature and immature ovary of the swimming crab provides new insights for further studies on the mechanism underlying ovarian development in this species.

Key words: *Portunus trituberculatus*; Ovarian development; Suppression subtractive hybridization

