

Health assessment of the Manila clams, *Ruditapes philippinarum*, obtained from fish-market and natural clam bed

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Abstract

Health indices including digest tubule atrophy, parasite burden and immune parameters were compared in the two groups of the Manila clams, *Ruditapes philippinarum* obtained from the fish market (originated from Wando) and the natural clam bed (collected from Gimyoung, Jeju). Digestive gland atrophy was scored from 0 to 2 according to the degree of thinning of the epithelial wall of the tubules in both groups. Infection intensity in terms of the number of the protozoan parasite *Perkinsus atlanticus* in the market clams averaged 833,000 cells/gram tissue wet weight, while no *Perkinsus* cells were found in the natural bed clams. Severe inflammatory response was observed in *Perkinsus* infected clams. Immune parameters such as hemocyte count and phagocytosis rate were measured by using a flow cytometer. The forward scatter (FSC) and side scatter (SSC) cytometric profile showed that market clams contained 2100 hemocytes/clam, and natural bed clams had about 7200 cells/clam in average. In addition, phagocytosis rate was measured after adding fluorescent-labeled particles. The data were initially analyzed for two-parameters: FSC and SSC, then the fluorescent (FL 1) frequency distribution histogram of the hemocyte was subsequently obtained. No phagocytosis was measured in the clams of market, but 3.74 % of hemocytes of the natural bed clams were in phagocytosis of particles. In conclusion, digestive gland atrophy do not show health condition of the Manila clams, but physiological conditions of the samples are well reflected by immune parameters such as hemocyte count and phagocytosis.

Key words: Digestive gland atrophy, immunity, hemocyte, *Ruditapes philippinarum*, flow cytometry.