

EFFECT OF A COMMERCIAL BACTERIAL PRODUCT ON WATER QUALITY AND SHRIMP PRODUCTION IN LOW WATER EXCHANGE SHRIMP CULTURE PONDS IN SRI LANKA

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Sequential inoculations of commercially produced bacterial products into the culture ponds are practiced in many shrimp farms in Sri Lanka. These bacterial products are purported to improve water and bacterial quality and shrimp production in culture ponds. Therefore, the effectiveness of a commercial bacterial product (A-Bact™) on water and bacterial quality and shrimp yield was investigated in *Penaeus monodon* culture ponds (0.35 ha) in Chilaw, Sri Lanka. Ponds were stocked with *P. monodon* post larvae at the rate of 20 m⁻² and water exchange commenced after eight weeks of the culture cycle when 20 – 30% water was exchanged one or two times a week. Three ponds were treated with bacterial product at the rate of 1 – 4 kg ha⁻¹ and one pond served as the control. Microorganisms claimed to contain in the product were identified using biochemical tests.

Results revealed that the total viable bacterial count of the product was (TVBC) 10⁷ – 10⁹ cells g⁻¹. The bacteria identified in the product were *Bacillus licheniformes*, *B. subtilis* and *Pseudomonas stutzeri*. Temperature, dissolved oxygen, pH, salinity, transparency, ammonium ions, ammonia, nitrite, nitrate and total phosphorus levels in pond water were not significantly different ($p > 0.05$) among treated and control ponds except for higher turbidity in one of the treatment ponds. TVBC and *Pseudomonas* and *Bacillus* counts in water and sediment were not significantly different ($p > 0.05$) between treatment ponds and the control pond except for lower TVBC in water in one of the treatment ponds. *Vibrio* counts in water column in the control pond ($2.6 \pm 0.8 \times 10^3$ CFU ml⁻¹) was significantly higher ($p < 0.05$) than that in the treatment ponds ($4.8 \pm 1.5 \times 10^2$ CFU ml⁻¹). Percent specific growth rate (SGR% day⁻¹), final average weight, feed conversion ratio (FCR), survival rate and yield in the treatment ponds varied from 3.0 – 3.4 day⁻¹, 28.0 – 31.6 g, 1.5 – 1.8, 31.2 – 38.6% and 1971.4 – 2328.5 Kg ha⁻¹, and in the control pond were 3.3 day⁻¹, 31.3 g, 1.9, 47.9% and 3000.0 Kg ha⁻¹, respectively. Addition of bacterial product did not improve water quality or shrimp production while it reduced the *Vibrio* population in the treatment ponds.