Evaluation of Autotrophic and Heterotrophic Microcosm-based Systems on the Production Response of *Litopenaeus vannamei* Intensively Nursed without *Artemia* and with Zero Water Exchange

M.J. Becerra-Dórame¹, L.R. Martínez-Córdova¹*, M. Martínez-Porchas², J.A. Lopez-Elías¹

¹ Departamento de Investigación Científicas y Tecnológicas de la Universidad de Sonora, Blvd. Colosio s/n, Building 7G, Hermosillo, Sonora, 83000 Mexico
² Centro de Investigaciones en Alimentación y Desarrollo A.C., Km 0.6 Carretera a La Victoria, Hermosillo, Sonora, México

(Received 12.8.10, Accepted 23.10.10)

Key words: shrimp nursery, autotrophic system, heterotrophic system, zero water exchange

Abstract
An experiment was conducted for 28 days to evaluate the productive response of the Pacific white shrimp (*Litopenaeus vannamei*) postlarvae, intensively nursed in autotrophic or heterotrophic microcosm-based treatments, without *Artemia* and zero water exchange. The autotrophic system was based on the promotion of microalgae as the main primary producers. The heterotrophic system was based on the promotion of bacteria as the main primary producers. The control was fed a conventional diet. Bioflocs and biofilms were used to promote biota in the autotrophic and heterotrophic systems. There were no differences in temperature, salinity, or DO among treatments. The chlorophyll a concentration and microalgae density were much greater in the control and autotrophic system than in the heterotrophic. The concentration of heterotrophic bacteria was significantly higher in the heterotrophic than in the autotrophic system and control. Individual weight gain was higher in the control (81±2 mg) and heterotrophic (77±8 mg) treatments than in the autotrophic (58±10 mg) but survival was better in the autotrophic (86%) than control (77%) and heterotrophic (76%) treatments. Final biomass was statistically similar in all treatments, as well as the feed conversion ratio which ranged from 0.65 (heterotrophic) to 0.69 (autotrophic). The increased natural productivity caused a positive productive response in the shrimp postlarvae. Such strategies can be an adequate alternative when *Artemia* is unavailable.

* Corresponding author. Tel.: +52-662-2592169, e-mail: lmtz@guaymas.uson.mx