

## **Growth performance of spiny lobster *Panulirus ornatus* in land-based Integrated Multi-Trophic Aquaculture (IMTA) system**

### **Abstract**

Aquaculture waste in the form of particulate organic matter and inorganic nutrients produces negative impacts when released to the environment. Integrated Multi-Trophic Aquaculture (IMTA) system is gaining importance for reasons of its environmental compatibility and quality of yield. The purpose of this study is to compare growth performance of a popular species of spiny lobster in two different rearing systems. These were modeled based on recirculating system (RS) and flow-through system (FTS). Spiny lobster (*Panulirus ornatus*), sea cucumber (*Holothuria scabra*) and seaweed (*Kappaphycus alvarezii*) were used in the trials in both these systems. Water flow rate was maintained at  $0.08 \pm 0.1$  L/sec. The stocking rate was 5 specimens / tank for spiny lobster (mean weight of  $151.44 \pm 7.14$  g) and sea cucumber (mean weight of  $32.16 \pm 1.40$  g), while mean initial biomass for seaweed was  $500.65 \pm 1.76$  g/tank. Trials were conducted for 10 weeks. The results indicated that the SGR of lobster was not significantly different ( $p > 0.05$ ) in FTS ( $0.125$  % day<sup>-1</sup>) and in RS ( $0.096$  % day<sup>-1</sup>). There was no significant difference ( $p > 0.05$ ) in the survival of spiny lobster in FTS and RS. The survival rate of spiny lobster was  $93.3$  % and  $80.0$  % in FTS and RS, respectively. The inorganic nutrients, namely ammonia (NH<sub>3</sub>), nitrite (NO<sub>2</sub>), nitrate (NO<sub>3</sub>) and phosphate (PO<sub>4</sub>) were significantly higher ( $p < 0.05$ ) in RS than in FTS. Evidently, the FTS is the better option for culture in terms of efficiency of water quality remediation and growth of the stocked species