

A new aquaculture method of giant tiger prawn to improve profitability by utilizing unused biological resources as supplementary live feeds

Production

Demonstration

Item: Penaeidae

Biomass utilization

Outline

A new method to use filamentous green alga (*Chaetomorpha* sp.) and microsnail (*Stenothyra* sp.) as supplementary live feed for giant tiger prawns in the early stages of aquaculture was developed. The weight of giant tiger prawns cultured by this method increased significantly and the profit was approximately 1.5 times higher than conventional methods. *Chaetomorpha* sp. and *Stenothyra* sp. are expected to be utilized in shrimp aquaculture due to their availability as untapped biological resources, and their suitability for cultivation in intensive shrimp ponds.

Background/effect/note

Penaeidae shrimp production in intensive aquaculture systems contribute to the economic development of developing tropical countries. However, decreasing shrimp productivity and profitability have been reported owing to deterioration in artificial feed quality and the soaring prices of artificial feed. We examined the profitability of giant tiger prawns produced with *Chaetomorpha* sp. and *Stenothyra* sp. as supplemental live feeds in 9m x 9m experimental ponds (Fig. 1). Giant tiger prawns were fed with 8% *Chaetomorpha* sp. and 2% *Stenothyra* sp. to total feed consumption in the early stage of cultivation, and we observed the differences in their growth from the fourth week (Fig. 2), and the production and profit were increased by about 1.3 and 1.5 times, respectively (Table 1). These untapped biological resources could be utilized for intensive aquaculture of other Penaeidae species and could improve the profitability of tropical Penaeidae farmers.

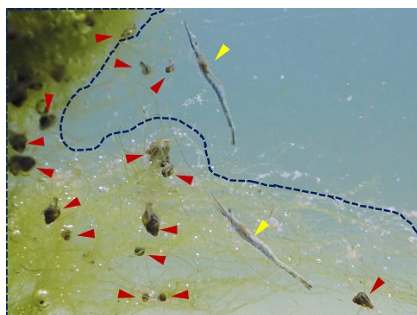


Fig. 1. Post-larvae (Total length: ~9 mm, Δ), *Chaetomorpha* sp. (area within dark blue broken line) and *Stenothyra* sp. (\blacktriangle)

Table 1. Results of giant tiger prawn aquaculture experiments in concrete aquaculture ponds

	Control area	Experimental area
Total prawn production (kg WW)	33.0	43.9 *
Artificial prawn feed cost (USD) (a)	83.55	98.59 *
Feed efficiency (%)	54.1	61.1 *
Miscellaneous costs (USD) (b)	—	12.11
Prawn Sales (USD) (c)	155.73	215.97 *
Profit (prawn sales minus costs) (USD) (c-a-b)	72.18	105.27 *

* in the same column indicate significant differences between control and experimental area (n=3) (t-test, $p < 0.05$). Miscellaneous costs are the costs spent on the propagation of supplementary live feed organisms. The increase in artificial feed cost is due to the increase in feed consumption. WW: wet weight.

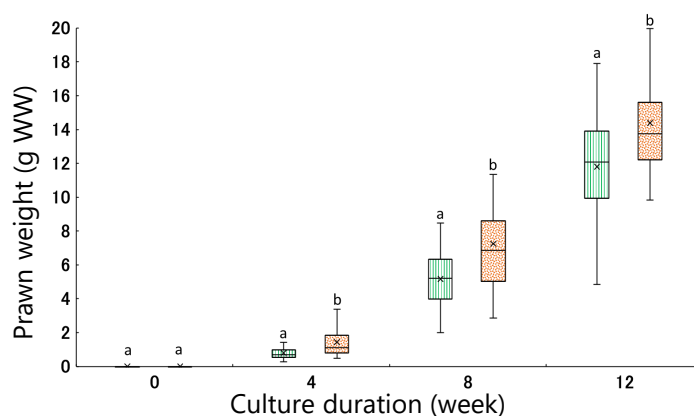


Fig. 2. Changes in wet weight of giant tiger prawn under control (■) and treatment (■) conditions

Control: Artificial feed only

Experiment: Artificial feed + *Chaetomorpha* sp. + *Stenothyra* sp.

Different lowercase letters within the same sampling week indicate a significant difference between treatments at a significance level of 0.05 adjusted for multiplicity.



Technical details:

https://www.jircas.go.jp/en/publication/research_results/2020_c09

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