ウシエビ養殖初期に糸状緑藻と微小巻貝を摂餌させることで収益性が向上する

Use of a filamentous green alga (*Chaetomorpha* sp.) and microsnail (*Stenothyra* sp.) as feed at an early stage of intensive aquaculture promotes profitability of giant tiger prawn

糸状緑藻ジュズモ属の一種（図1）と微小巻貝ミズゴマツボ属の一種（図1）を補助的生餌料としてウシエビを生産し、仲買業者に販売（図2）して収益性を検証した。タイ・キングモンクット工科大学ラカバン（KMITL）の大型コンクリート実験池（9×9×1.2m）を用いて実験を行った。ウシエビ養殖初期において、糸状緑藻（ジュズモ属の一種）を総消費餌料量の8%、微小巻貝（ミズゴマツボ属の一種）を同2%、人工飼料とともに摂餌させることにより、4週目よりウシエビの成長に差異が見られはじめ（図3）養殖の収益性が約1.5倍向上した（表1）。

表1　KMITLのコンクリート実験池での15週にわたるウシエビ養殖試験結果
Table 1. Results of the 15-week giant tiger prawn aquaculture experiment in a concrete pond at KMITL

	対照区 Control	実験区 Experiment
成長・生産性 Growth and productivity		
収穫時個体重量 (g WW) Final individual shrimp weight	16.0 ± 0.61	18.2 ± 1.07 *
収穫量 (kg WW) Total shrimp production	33.0 ± 1.8	43.9 ± 0.5 *
摂餌量・飼料効率 Feed intake and efficiency		
ジュズモ量 (kg WW) Apparent *Chaetomorpha* intake	—	6.81 ± 1.45
ミズゴマツボ量 (kg WW) Apparent *Stenothyra* intake	—	1.96 ± 0.05
人工飼料量 (kg WW) Apparent artificial feed intake	61.0 ± 3.2	72.0 ± 3.8 *
人工飼料効率 (%) Feed efficiency	54.1 ± 1.8	61.1 ± 4.0 *
コスト・収益性 Costs and profitability		
人工飼料費 (USD) (a) Artificial shrimp feed costs	83.55 ± 4.45	98.59 ± 5.24 *
諸雑費 (USD) (b) Miscellaneous costs	—	12.11 ± 0.00
エビ販売価格 (USD) (c) Shrimp sales	155.73 ± 10.27	215.97 ± 4.37 *
収益 (USD) (c-a-b) Balance between sales and costs	72.18 ± 7.55	105.27 ± 3.02 *

平均値±標準偏差．同じ項目における*印は実験区間に有意な差異があることを示す（n=3，t検定，p<0.05）
Values are shown as mean ± standard deviation. Superscript labels within the same row indicate significant difference (n = 3, t-test, p < 0.05).

The profitability of giant tiger prawn was evaluated for a system in which *Chaetomorpha* sp. and *Stenothyra* sp. are propagated and freely consumed during an early culture stage as supplementary feeds. The shrimp was cultured in outdoor concrete ponds (9 × 9 × 1.2 m) under control (fed artificial feed, n = 3) or experimental (fed artificial feed and benthic species, n = 3) conditions until they reached marketable size (15 weeks) (Figs. 1 & 2, Table 1). A difference in weight had been shown since the 4th week (Fig. 3), and profitability was significantly higher (~1.5 times) in the experimental group, which were fed ~8% of *Chaetomorpha* and ~2% of *Stenothyra* to total feed consumption, respectively (Table 1).

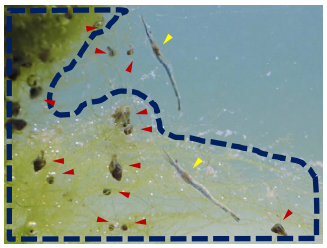

図1　放流直後のウシエビ（全長約9mm）（黄矢印）とジュズモ（紺枠）・ミズゴマツボ（赤矢印）

Fig. 1. Post-larvae just after release to experimental pond (total length: ~9 mm, yellow arrows), *Chaetomorpha* sp. (area within dark blue broken line) and *Stenothyra* sp. (red arrows)

図2　実験により収獲されたウシエビと仲買所での仕分け作業

Fig. 2. Sorting operation at a shrimp broker company for giant tiger prawn produced from this study

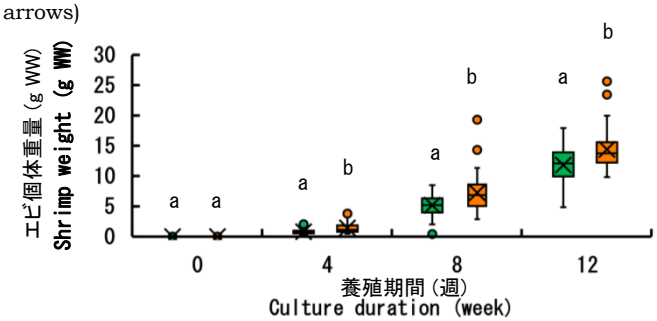

図3　対照区（緑）と実験区（橙）におけるウシエビの体重変化
同じサンプリング週における異なるアルファベットは実験区間に有意な差異があることを示す（Mann-Whitney U検定，p < 0.05として繰り返し検定の多重性をBonferroni法で補正）

Fig. 3. Changes in wet weight of giant tiger prawn under control (green) and treatment (orange) conditions.
Different lowercase letters within the same sampling week indicate a significant difference between treatments (Mann-Whitney U-test, p < 0.05, adjusted via the Bonferroni correction for multiplicity)

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