Pigmentary and Zootechnical Responses of Juvenile *Litopenaeus vannamei* (Boone, 1931) Maintained on Diets Supplemented with Xanthophylls of Marigold *Tagetes erecta* Flowers

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**Abstract**

Practical diets supplemented with 75 or 150 ppm xanthophylls (75% zeaxanthin, 15% lutein) industrially extracted from marigold (*Tagetes erecta* L.) flowers increased the astaxanthin and total carotenoid concentrations in juvenile *Litopenaeus vannamei*, compared to shrimp fed a practical control diet. Our results paralleled or exceeded those obtained with a diet containing 75 ppm supplementary synthetic astaxanthin. The post-feeding astaxanthin concentration accounted for more than 84% of the total carotenoid concentration in shrimp fed either diet, while beta-carotene, zeaxanthin, lutein, and other non-identifiable carotenoids comprised a minority of the total concentration. That this was seen in both the tail exoskeleton and abdominal muscle indicates that *L. vannamei* can metabolize precursor xanthophylls to produce astaxanthin. In most cases, more than 60% of the astaxanthin was esterified. In general, survival improved in shrimps fed the supplemented diets compared to those fed the control diet. There were no differences in growth.

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