

Effect of dietary protein level on spawning and egg quality of redclaw crayfish *Cherax quadricarinatus*

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Received 19 July 2005; received in revised form 18 January 2006; accepted 18 January 2006

Abstract

The effect of dietary protein level on spawning and egg quality was evaluated for female *Cherax quadricarinatus*. Diets containing four different levels of crude protein were evaluated (22, 27, 32, and 37%). After 100 days, no significant effects of protein level were found on survival (78.6–84.5%), final weight (41.0–43.1g), or fecundity (8.5–9.2 eggs/g female). The percentage of spawning females ranged from 19.7 to 27.3%, and a significant fit, using a quadratic equation estimated maximum spawning to occur at 30% crude protein. Significantly greater egg area (3.90 mm²), volume (39.3 mm³), weight (5.44 µg), and diameter (2.27 mm) were observed at 32% crude protein. There were no significant differences in mean egg protein (2227.1 ± 445.0 µg/egg), lipid (430.9 ± 85.2 µg/egg) and carbohydrate (73.9 ± 10.6 µg/egg) contents, and energy (13.3 ± 2.1 kcal/egg) in relation to dietary protein level. High statistical power indicated that biochemical composition was not affected by dietary protein level. We conclude that a dietary crude protein content of 32% is recommended for reproduction of female redclaw crayfish.

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Keywords: Redclaw crayfish; *Cherax quadricarinatus*; Dietary protein; Spawning; Egg quality

1. Introduction

Aquaculture production of Australian redclaw crayfish is expanding in Australia (Jones, 1995), Ecuador (Romero, 1997), Thailand and Malaysia (Chang, 2001), United States (Masser and Rouse, 1993), and Mexico (Villarreal and Peláez, 1999).

Several authors (e.g. Mills and McCloud, 1983; Villarreal and Peláez, 1999; Jones, 1995) have demonstrated that production of *Cherax* spp. can be increased when formulated feeds are used. Reports on the use of experimental diets for *C. quadricarinatus* (Meade and Watts, 1995; Cortés-Jacinto et al., 2003, 2005; Hernández-Vergara et al., 2003) outline basic nutritional requirements for growout. However, very little information on requirements for optimum egg quality production of broodstock exists.

Several studies have evaluated maturation, eye ablation (Sagi et al., 1997), use of hormones (Abdu et

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