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Effect of unilateral and bilateral eyestalk ablation in *Litopenaeus vannamei* male and female on several metabolic and immunologic variables

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Eyestalk ablation is the most common procedure to induce gonadic maturation in commercial hatcheries of penaeid shrimp. In addition to reproduction, other physiological and metabolic processes are affected by removal of the X-organ sinus gland complex located in the eyestalk. In this study, the effect of unilateral and bilateral eyestalk ablation on the concentration of several hemolymph metabolites and phenoloxidase system in female and male shrimp was investigated. As a consequence of reducing or suppressing moltinhibiting hormone (MIH) production, the duration of the molting cycle was significantly shorter in eyestalkablated shrimp: bilaterally (10 days), unilaterally (17 days), and shrimp that were not ablated (24 days). Mortality was significantly higher in unilaterally (35%) and bilaterally (68%) ablated shrimp than in untreated shrimp (2%), probably caused by impairment of several physiological functions mediated by hormones from the eyestalk and direct injury of the nervous system. Males and females were affected differently by eyestalk ablation in terms of concentrations of glucose, triglycerides, and protein in hemolymph. Glucose and lactate levels were lower in bilaterally ablated shrimp, as expected by the role of crustacean hyperglycemic hormona in glucose metabolism. Cholesterol and hemocyte count were not significantly different among the three treatments. Prophenoloxidase and phenoloxidase activities were significantly lower in bilaterally, but not in unilaterally ablated shrimp. This could suggest an endocrine control of this mechanism of the effector immune response or reflect the level of physiological trauma caused by bilateral eyestalk ablation in this species

Palabras clave: Hemolymph metabolites, shrimp, Phenoloxidase, Sinus gland

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