DIETARY AÇAI (Euterpe oleracea Martius) OPTIMIZES GROWTH PERFORMANCE AND INTESTINAL ANTIOXIDANT CAPACITY IN Colossoma macropomum JUVENILES

Thamyres Vanessa Nascimento da Silva1; Camila Ferreira dos Santos2; Marcelo Ferreira Torres3; Luis André Luz Barbás4; Luís André Sampaio5; Pablo Emilio Verde6; Marcelo Borges Tesser7; José Maria Monserrat8

1thamyrestvns@gmail.com, Mestre em Aquicultura/FURG; 2camila.sanfer3@gmail.com, Tecnólogo em Aquicultura/IFPA; 3marcelotorresifpa@gmail.com, Professor, Doutor em Desenvolvimento Sustentável do Trópico Úmido – DTU/IFPA; 4andre.barbas@hotmail.com, Professor, Doutor em Aquicultura/IFPA; 5sampaio@mikrus.com.br, Professor, Doutor em Oceanografia Biológica/FURG; 6pabloemilio.verte@hu.de, Professor, Doutor em Ciências Naturais - Especialidade Estatística/University of Düsseldorf; 7mbtesser@gmail.com, Professor, Doutor em Aquicultura/FURG; 8josemmmonserrat@gmail.com, Professor, Doutor em Oceanografia Biológica/FURG.

ABSTRACT: The use of plant-rich in phytochemicals (e.g. phenolic and flavonoids) can improve the general physiological conditions, as well as zootechnical performance. The Amazonian açaí palm (Euterpe oleracea) contains redox active molecules with important health benefits in different animal models. It was evaluated the potential effect of the dietary intake of lyophilized E. oleracea (LEO) on growth performance and redox status of tambaqui juveniles (Colossoma macropomum), and also the economic efficiency of diets. The experiment was approved by the Ethics Committee of Animal of the Instituto Federal do Pará – IFPA (CEUA n° 3095220419). Fish (0.92 ± 0.01 g) were randomly distributed in 18 tanks (200 L; 50 fish/tank) and fed six diets with graded levels of inclusion of LEO at 0.00, 0.63, 1.25, 2.50, 5.00, and 10.0% (w/w). Fish were hand-fed four times a day at 10% of body weight for 30 days. Dietary inclusion levels of açaí as well as the control diet treatment were performed in triplicate. The water quality was monitored and maintained in conditions recommended for C. macropomum. At the end of the feeding period, growth performance was calculated and fish were sampled (n = 15/treatment) for the determination of total antioxidant capacity (ACAP) and level of lipid peroxidation (TBARS) in the intestine, liver and muscle. Centesimal composition, antioxidant capacity (AC%) against DPPH, total flavonoid (TF) and total polyphenols (TP) were determined in the diets and muscle. A linear mixed effects model was applied to analyze the effects on the zootechnical performance and biochemistry parameters. Other data were analyzed by one-way ANOVA followed by Newman-Keuls post-hoc test (5%). The growth performance and feed utilization by fish were improved, particularly in groups fed diets with 5.00% and 10.0% LEO. The centesimal composition of the fish carcass was not altered. No significant changes in the TFC, TPC and the AC% against DPPH in the muscle. The inclusion from 0.63% LEO (6.3 g of açaí kg⁻¹) in the diet increases by 39.57% the ACAP in the intestine in relation to control. In the liver and muscle the ACAP was not altered. In respect to control, there were no change in the level of lipid peroxidation in the liver and muscle by the consumption of LEO. However, a polynomial 2nd order regression show reduction of TBARS in the intestine with açaí-added feed reaching a minimum at 5.47% inclusion of LEO (54.7 g of açaí kg⁻¹) in the diet. The evaluation of the economic benefit revealed that the feed costs to gain a kilogram of live weight are practicable up to 1.25% LEO inclusion and up to 2.50% LEO in the diet to produce a kilogram of protein. Dietary LEO at an inclusion up to 1.25% (12.5 g of açaí kg⁻¹) is recommended to improve growth performance, feed utilization and total antioxidant capacity intestinal with economic efficiency.

Key words: Amazonian fruit; Feed additive; Oxidative stress; Economic efficiency; Teleosts.

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