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Replacement of Fishmeal with Black Soldier Fly Larvae Meal in Tambaqui Juvenile Feeding

Carlos Henrique de Melo Silva*[1], Pedro Gomes Gamarano[2], Leandro Santos Costa[2], Felipe Guedes de Araújo[1]
[1]Universidade Federal do Agreste de Pernambuco, Garanhuns/Pernambuco, Brasil; [2]Universidade Federal de Minas Gerais, Belo Horizonte/Minas Gerais, Brasil. * carloshenriquemelo94@gmail.com

Global population growth is driving an increased demand for food, making the search for economically viable and ecologically sustainable production practices a major concern. In aquaculture, fishmeal (FM) has been extensively used, but it may not be a dependable resource to accommodate aquaculture growth since its production poses ecological and economical challenges as it often involves overfishing and can disrupt marine ecosystems and because fish meal is expensive and its price is volatile. In this context, exploring alternatives to replace fishmeal in the nutrition of aquatic organisms becomes imperative. Insect larvae meal, such as black soldier fly (*Hermetia illucens*) meal, emerges as a promising option due to its ease of production and utilization of organic waste. This study aimed to assess the performance of tambaqui (*Colossoma macropomum*) juveniles fed diets where fishmeal was replaced with different levels of black soldier fly larvae meal (BSM). The experiment utilized 75 tambaquis juveniles with an initial weight of 68.19 ± 0.49 g, distributed across 15 tanks of 100 L capacity in a water recirculation system. The fish were fed twice daily for 60 days. After each feeding, remaining feed was collected, dried, and weighed to determine consumption. The experimental design included 5 treatments (0.0%, 12.5%, 25.0%, 35.7%, and 50% replacement of FM with BSM) with 3 replicates per treatment. At the conclusion of the experiment, data on final weight and feed consumption were gathered, and the apparent feed conversion ratio (FCR) was calculated. No significant difference was observed between the treatments; the final weight of the fish was higher in the control treatment (272.05 ± 12.22 g) compared to the other FM replacement levels ($p < 0.05$). FCR increased with the inclusion of BSM, showing a significant difference from the 37.5% replacement level ($p < 0.05$). The final weight of tambaqui juveniles was not influenced by the inclusion of This study underscores the importance of seeking sustainable alternatives to fishmeal in aquaculture. The utilization of BSM offers a promising avenue due to its advantages in production efficiency and waste management. However, its impact on growth performance and feed conversion ratio in tambaqui juveniles suggests the necessity for careful consideration of diet formulations. The findings imply that while BSM can be integrated into the diet, high replacement levels may compromise feed efficiency. New research with isoproteic and isoenergetic diets is needed to evaluate the potential use of BSM in feeding tambaqui juveniles. The experiment was conducted following the norms of the Ethics Committee on Animal Use (CEUA), protocol UFMG 31/2023.

Keywords: *Colossoma macropomum*, *Hermetia illucens*, nutrition, fishmeal.

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