

# EFFECT OF RHODOPSEUDOMONAS PALUSTRIS BIOMASS ON SURVIVAL OF TAMBAQUI INFECTED WITH AEROMONAS JANDAEI

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SERRA; Bianca Natally Viana<sup>1</sup>, FERREIRA; Mariluce dos Reis<sup>2</sup>, FERNANDES; Indra Mary Costa<sup>3</sup>, OLIVEIRA; Sarah Ragonha de<sup>4</sup>, PEREIRA; Elcimara Cardoso<sup>5</sup>, CHUNG; Samantha<sup>6</sup>, SOUZA; Joana Paula de Souza<sup>7</sup>, KOTZENT; Suzana<sup>8</sup>, JUNIOR; Lucas Pedro Gonçalves<sup>9</sup>, GALLANI; Sílvia Umeda<sup>10</sup>

## RESUMO

This study evaluated the effects of *Rhodopseudomonas palustris* biomass supplementation (0, 0.5%, 1.5%, 3% and 6%) on survival of tambaqui *Colossoma macropomum* after 28 days of feeding. To produce the diet additive (bacterial biomass), the effluent from a fishery slaughterhouse (250L) was pasteurized (75°C/30 min) and distributed in 10 bioreactors (25L/unit), for use as substract for bacteria growth (biomass production). The cultivation conditions included the incubation in bioreactors at room temperature, during 7 days, with light (100W/2700K). The condition also included the addition of 250mL (1%v/v) of *R. palustris* pre-inoculum (Amazon autochthonous strain MFRP01, previously cultivated in Pfennig broth at 34°C/5 days/100W/2700K) in each bioreactor. The product was recovered by sampling the decanted biomass, which was freezed and lyophilized (-40°C/72h). The resultant powder was incorporated into commercial fish feed according treatment, and then pelleted by feed mill. The pellets were dried (55°C/24h) and stored (-20°C). For experimental assay, tambaqui juveniles (n=600±2g) were distributed in 20 tanks (500L) encompassing 5 treatments (levels of the additive, corresponding to grams of biomass per kilogram of fish feed): T<sub>1</sub>(control):0g/Kg; T<sub>2</sub>:0.5g/Kg; T<sub>3</sub>:1.5g/Kg; T<sub>4</sub>:3g/Kg and T<sub>5</sub>:6g/Kg). Fish were fed three times per day during 4 weeks until apparent satiety. After this period, seven fishes per tank were anesthetized (benzocaine 0.1g/L) and inoculated intraperitoneally with 0.1mL of *Aeromonas jandaei* (AM70 pathogenic strain, previously grown in TSB 28°C/48h), suspended in sterile PBS until reach 1.01nm/OD<sub>600</sub>, corresponding to 10<sup>8</sup>CFU/mL. The results showed that diet consumption did not differ among treatments and fish fed with biomass at 0.5g/Kg (T<sub>2</sub>) presented higher survival against *A. jandaei* infection (p<0.05) than control, indicating a potential immunostimulant response, triggered by supplementation. On the other hand, fish supplemented with the highest dose of additive (T<sub>5</sub>) showed higher mortality than control, indicating a negative effect, probably due to overwhelm the immune system triggered by diet, leading to inflammation or immune suppression, making fish more susceptible to *Aeromonas*-infection. This study indicates the supplementation of *R. palustris* biomass at 0.5g/Kg (0.5%) during a short period (28 days) to strategically prevent tambaqui against *Aeromonas*-infection, which encourages the development of aquaculture in the One Health-context (fish:environment:consumers). Funding source: Biodiversa/Fapeam(01.02.016301.03247/2021-54), Universal/CNPq (Processo nº422010/2021-9), PROCAD/Amazônia(Proc.88881.200614/2018-01) and INCT-Peixes-MCTIC/CNPq (Proc.405706/2022-7).

**PALAVRAS-CHAVE:** Immune responses, bacterial challenge, additive

<sup>1</sup> Universidade Nilton Lins, biancanatally2@hotmail.com

<sup>2</sup> Universidade Nilton Lins, mariluce.ferreira@ifam.edu.br

<sup>3</sup> Universidade Nilton Lins, indrahwang.18@gmail.com

<sup>4</sup> Universidade Nilton Lins, sarah@ifam.edu.br

<sup>5</sup> Universidade Nilton Lins, elcimacardoso94@gmail.com

<sup>6</sup> Universidade Nilton Lins, hung321@gmail.com

<sup>7</sup> Universidade Nilton Lins, joanapaula\_aqui@hotmail.com

<sup>8</sup> Universidade Nilton Lins, su\_kotzent@hotmail.com

<sup>9</sup> Universidade Nilton Lins, lpgoncalvesjr@hotmail.com

<sup>10</sup> Universidade Nilton Lins, silviaugallani@gmail.com