

**PROBIOTICS FOR NILE TILAPIAS, *Oreochromis niloticus*
 SUBMITTED TO CHALLENGE WITH *Aeromonas hydrophila* AND
*Streptococcus iniae***



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INTRODUCTION

Probiotics:

- food supplements of living microorganisms that benefits the host health through several mechanisms;
- sustainable management of aquaculture;
- functional foods.
- *Saccharomyces cerevisiae*, *Aspergillus oryzae*, *Bacillus subtilis*

OBJECTIVE

- Evaluation of *Bacillus subtilis*, *Aspergillus oryzae* and *Saccharomyces cerevisiae* as potential probiotic and their effect on immune parameters and survival against bacterial challenge with *Aeromonas hydrophila* and *Streptococcus iniae*.

MATERIAL AND METHODS

• Laboratory of Fish Diseases – Fisheries and Applied Aquacultures, Auburn University - USA ;

- Control diet;
- 5 g.kg⁻¹ probiotic ;
- 10 g.kg⁻¹ probiotic.



Fig. 1. Experimental diet preparation.



Fig. 2. Experimental aquaria.

• 720 fishes (25g ± 0,5g) distributed into 45 aquaria, into 9 experimental groups, with 5 replicates each;

• Blood samples were taken and analyzed for RBC, erythrocyte fragility, hematocrit, hemoglobin, MVC and MCHC. Cortisol and glucose tests were made with plasma;

• Coelomic macrophages were isolated from 10 fish in each group and tested for superoxide anion production using NBT;

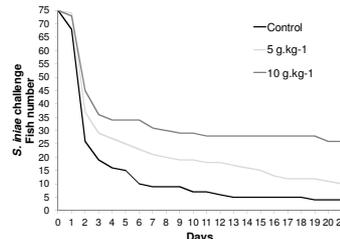
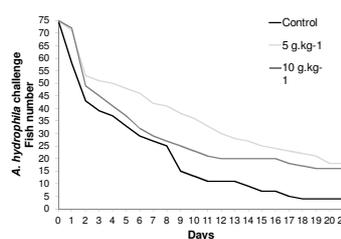
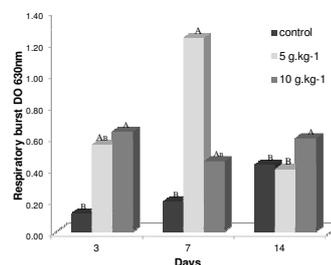
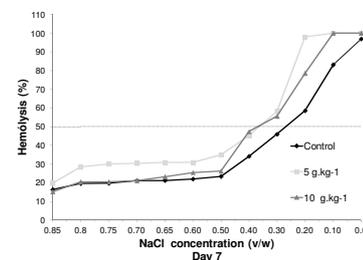
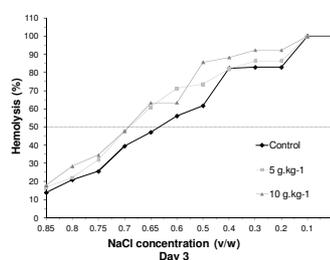
• At the end of the feeding trial, fish were IP injected with 100 µL PBS with 2 x 10⁶ mL live *A. hydrophila* and 1 x 10⁴ mL live *S. iniae* each. For negative control group, fish were injected PBS.

• Survival percentage was recorded up to the 21th day of challenge;

• ANOVA and normality, multiple comparisons with Tukey's test to analyze differences between treatments (P<0,05).

RESULTS AND DISCUSSION

- MCV and MCHM did not show changes during the experiment.
- Increase in RBC, plasma glucose and cortisol was observed in fishes of control group;



CONCLUSION

- Doses of 5 and 10 g.kg⁻¹ of probiotic ensured the highest survival rates for tilapia against *A. hydrophila*;
- Dose of 10 g.kg⁻¹ of probiotic promoted higher survival tax against *S. iniae*;
- The probiotic containing *Bacillus subtilis*, *Aspergillus oryzae* and *Saccharomyces cerevisiae* is safe for fish food use, and promote an increase in nonspecific immunity against bacterial diseases.