



Autochthonous vs allochthonous probiotic strains to *Rhamdia quelen*

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ABSTRACT

The aim of this study was to obtain an autochthonous probiotic candidate strain from the silver catfish (*Rhamdia quelen*) intestinal tract, comparing its *in vivo* performance with an allochthonous probiotic isolated from another fish, Nile tilapia (*Oreochromis niloticus*), in a growth performance assay. The study was divided in two parts: *in vitro* and *in vivo* assay followed by challenge with *A. hydrophila*. In the *in vitro* assay, the species-specific isolated strain *Lactococcus lactis* presented characteristics such as: absence of hemolysis, antagonism to bacterial pathogens isolated from freshwater fish, and considerable speed of duplication. In the *in vivo* trial, both fish supplemented with autochthonous or allochthonous strains presented an increase the final concentration of lactic acid bacteria in the intestinal tract of the fish after 60 days of dietary supplementation reaching concentrations of 1×10^7 CFU g⁻¹ and 4×10^7 UFC.g⁻¹, respectively. In addition, the autochthonous strain increased the mean corpuscular hemoglobin (MCH) of the treated animals, but no significant differences were observed in the other hemato-immunological and zootechnical parameters between treatments. After challenge with *Aeromonas hydrophila*, only animals that received autochthonous probiotic supplementation showed an increase in the serum total immunoglobulin concentration, but not enough to observe a significant difference in the survival rate between the treatments. Dietary supplementation of the probiotic allochthonous strain did not demonstrate any effects superior to those of the isolated autochthonous strain. Although the autochthonous strain did not present significant improvements in the other parameters evaluated in this study, it was able to inhibit bacterial pathogens *in vitro*, to increase the final concentration of LAB's and the amount of immunoglobulin after experimental challenge, demonstrating probiotic potential. This study demonstrated for the first time the isolation and *in vivo* use of an autochthonous probiotic strain isolated from silver catfish, as well as its comparative evaluation with the performance of allochthonous probiotic.

1. Introduction

The growing interest in the cultivation of the silver catfish *Rhamdia quelen* (Quoy & Gaimard, 1824) in southern Brazil is due to its excellent adaptation to the environmental conditions of the region as well as its growth performance and good acceptance of the consumer market, being considered as one of the three main freshwater fish species cultivated in the region [1–3].

The interest in the cultivation of this species has led to an increasingly intensive production system that exposes fish to high feeding and stocking densities. Such practices combined with inadequate sanitary

management, culminate in production losses associated mainly with bacterial infections [4]. Amongst the bacterial diseases, aeromoniosis caused by the bacterium *Aeromonas hydrophila* is one of the most common. Many species of fish are susceptible to this particular bacteriosis, such as carps, goldfish (*Carassius auratus auratus*) and silver catfish (*Rhamdia quelen*), which has led to high economic losses in the aquaculture sector [5].

Currently, diseases of bacterial origin have been combated in the farmings with the use of antibiotics. Although costly, these chemotherapeutics are widely used to treat, prevent and/or promote fish growth because of their rapid mode of action and easy availability in

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