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MOTORE® INCREASED CEREBRAL SUPEROXIDE DISMUTASE ACTIVITY OF RHAMDIA QUELEN DÁUMA INFECTED WITH AEROMONAS HYDROPHILA [1]

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Introduction: *Aeromonas hydrophila* is a fish pathogenic bacterium which represents a serious problem in organic aquaculture. This way, superoxide dismutase (SOD) is an enzymatic antioxidant defense, which catalyzes the dismutation of the superoxide radical into either ordinary molecular oxygen or hydrogen peroxide both less reactive species than the radical form. The aim of this study was to evaluate whether *Aeromonas hydrophila* alters the SOD activity in brain of *Rhamdia quelen* dáuma and the effect of pretreatment with Motore® (*Curcuma longa*) in this enzyme activity. Methodology: *Rhamdia quelen dáuma* were pretreated with Motore® (250 to 750 mg/kg) for 90 days, at the 75^{th} day of treatment fish were inoculated with $9x10^6$ UFC/mL of *Aeromonas hydrophila.* At the end of pretreatment, the brains of *Rhamdia quelen dáuma* were collected to determine the SOD activity (n=6/group). The enzyme activity was assayed spectrophotometrically. This method is based on the capacity of SOD in inhibiting epinephrine autoxidation to epinechrome. The color reaction was measured at 480 nm. Aliquots of low speed supernatant were added in a 50 mM Na_2CO_3 buffer pH 10.3 and the enzymatic reaction was initiated by adding epinephrine. One unit of SOD was defined as the amount of enzyme required to inhibit the rate of epinephrine auto oxidation by 50 % at 26 °C. The enzymatic activity was expressed as SOD Units/mg protein. The comparison among groups was performed by two-way ANOVA, followed by the Bonferroni post-hoc test when appropriate.Values of $p < 0.05$ were considered significant. The present study was approved by the Ethics Committee on Animal Experimentation of UFSM and registered under the number 4307280717. Results: SOD activity was reduced in brain samples of *Rhamdia quelen dáuma* experimentally infected with *Aeromonas hydrophila* (Infected control group) when compared to the healthy control group. These results suggest the activation of enzymatic antioxidant defense in opposite to damage caused by *Aeromonas hydrophila* in brain of fish. Motore® only at the dose of 750 mg/kg revealed a *per se* increase in the SOD activity. This effect remained the same in fish experimentally infected and pretreated with the highest dose of Motore. The antioxidant activity of Motore is in accordance with the previously reported antioxidant effect of *Curcuma longa.* Conclusion: Our data support the idea that *Aeromonas hydrophila* can lead to brain damage of *Rhamdia quelen* by oxidative stress. Motore® at the highest dose showed the best antioxidant effect. Thus, more studies are necessary to evaluate other antioxidant parameters and the potential of Motore® to be used in the

control and/or treatment of bacterial infections in organic aquaculture.