

Mitochondrial Bioenergetic: Comparative Studies between *Lophiosilurus alexandri* and *Oreochromis niloticus*

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INTRODUCTION: *Lophiosilurus alexandri* (pacamã) is a native fish from São Francisco river. However, nothing is known about its bioenergetic parameters. Mitochondria is the main responsible for ATP synthesis, most of catabolic cell reactions, ROS production and many other functions. **AIM:** In this study, we sought to investigate some bioenergetic parameters of isolated liver mitochondria from pacamã and comparing to a known fish, *Oreochromis niloticus* (tilapia), as control. The antioxidants system also was evaluated. **MATERIAL AND METHODS:** The activity of each complex from respiratory chain was performed using specific substrates and inhibitors (Hansatech Oxygraph). Mitochondrial H₂O₂ (Amplex-red) production was spectrofluorimetric determined. The antioxidant enzymes activity (superoxide dismutase, SOD; Catalase, CAT and glutathione peroxidase, GPx) were spectrophotometric measured. **RESULTS AND DISCUSSION:** The mitochondrial respiratory control of pacamã is lower than tilapia, for Complex I (20%) and Complex II (28%), but the rates of O₂ consumption from Complex III and Complex IV were higher in pacamã than in tilapia, 151% and 220% respectively. We observed an average increase about 19% in mitochondrial H₂O₂ production of pacamã when compared to tilapia. We also found a significant decrease in the antioxidant enzymes activity CAT and GPX of liver pacamã compared with liver from tilapia. However an increase in SOD activity was observed in liver from pacamã. **CONCLUSIONS:** The results indicates that, liver mitochondria from pacamã has the four functional complexes in the respiratory chain, produces mitochondrial H₂O₂, and has the activity of the antioxidant enzymes according to this H₂O₂ production.

Word Keys: Mitochondrial bioenergetic, reactive oxygen species, *Lophiosilurus alexandri*.

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