INDUCED SWIMMING ACTIVITY MODULATES THE ANTIOXIDANT STATUS IN LIVER AND SKELETAL MUSCLE OF EUROPEAN EEL (*Anguilla anguilla*)

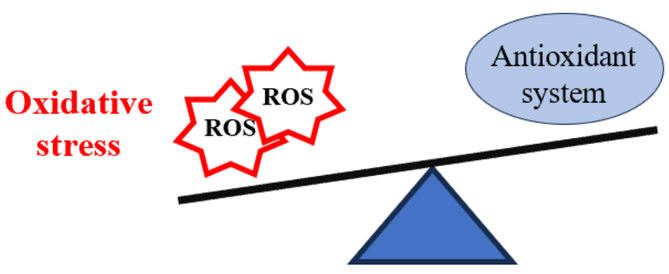
C. Espírito-Santo[1,2], F. A. Guardiola[3], R. O. A. Ozório[2], L. J. Magnoni[4]

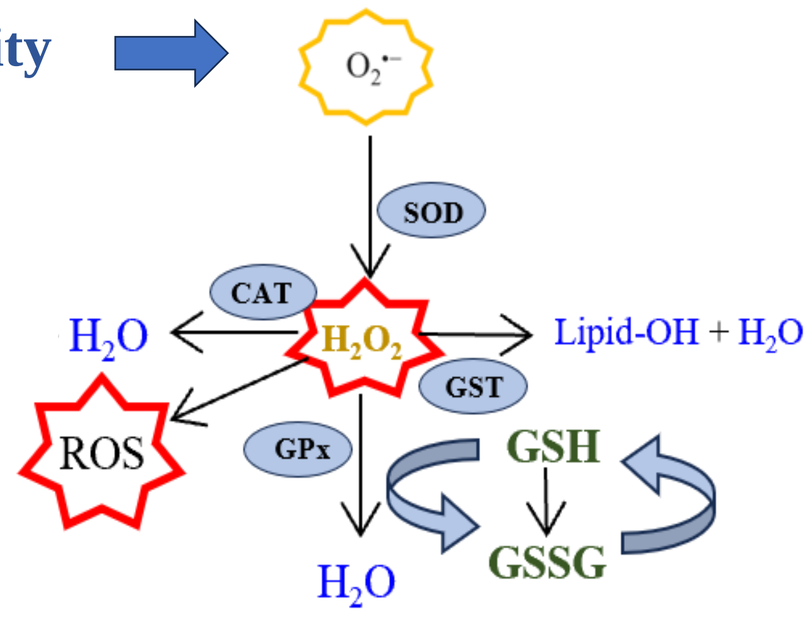
[1] Faculty of Sciences, University of Porto, Portugal
[2] Interdisciplinary Centre of Marine and Environmental Research (CIIMAR), Matosinhos, Portugal
[3] Immunobiology for Aquaculture Group, Department of Cell Biology and Histology, Faculty of Biology, University of Murcia, Spain
[4] The New Zealand Institute for Plant and Food Research Limited, Nelson, New Zealand

INTRODUCTION

Induced swimming activity

Antioxidant status
modulation depending on the conditions applied





OBJECTIVE

Evaluate the effects of induced swimming activity on the antioxidant status of **liver** and **skeletal muscle** (anterior and posterior) in yellow European eel.

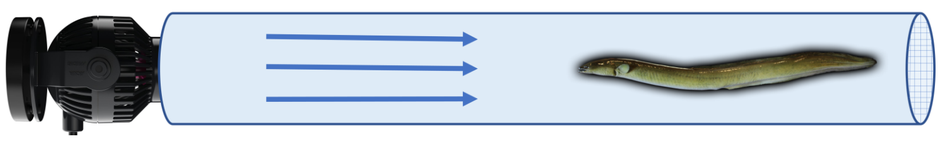
METHODOLOGY

➢ **Individual experimental trials for 7 hours:**

No induced swimming (NS)

N = 8

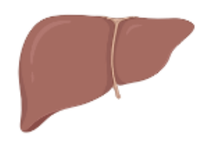
Swimming at 0.3 BL s^{-1} (S)



N = 8

TL: 39.9 ± 0.7 cm; BW: 108.8 ± 6.1 g

Liver



Posterior skeletal muscle

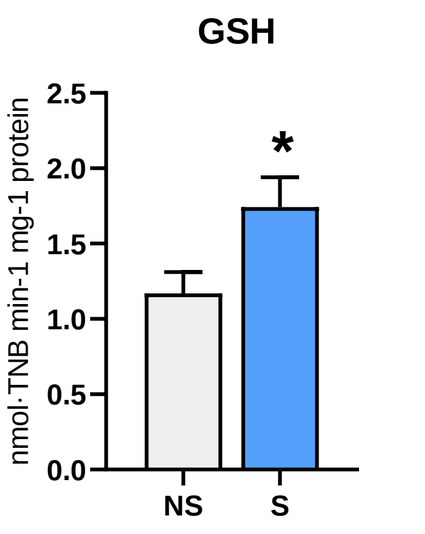
Anterior skeletal muscle

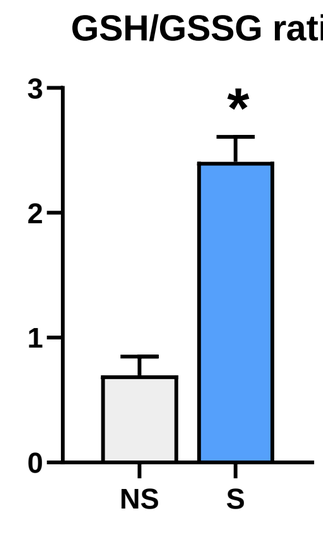
Oxidative stress biomarkers

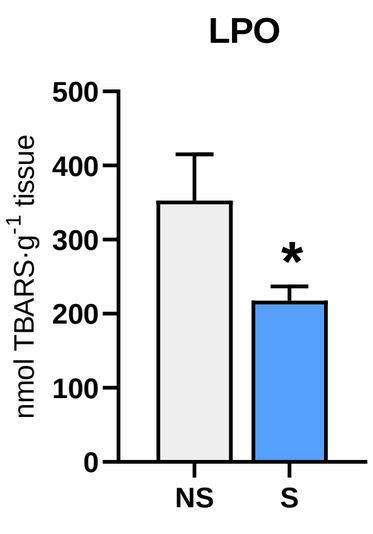
- Reduced glutathione (**GSH**)
- Oxidized glutathione (**GSSG**)
- Lipid peroxidation (**LPO**)
- Superoxide dismutase (**SOD**)
- Catalase (**CAT**)
- Glutathione reductase (**GR**)
- Glutathione peroxidase (**GPx**)
- Glutathione s-transferase (**GST**)

RESULTS

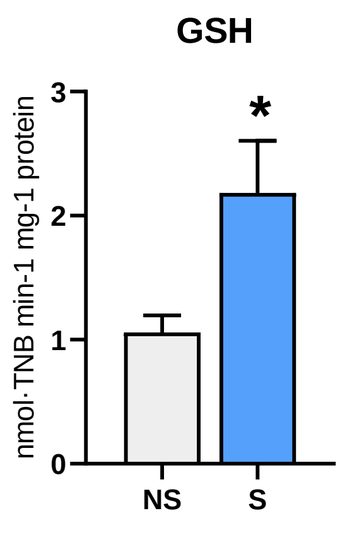
Liver

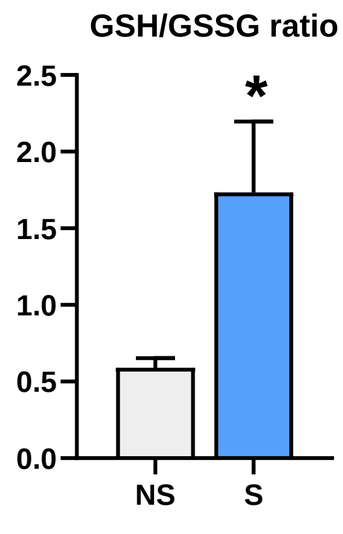


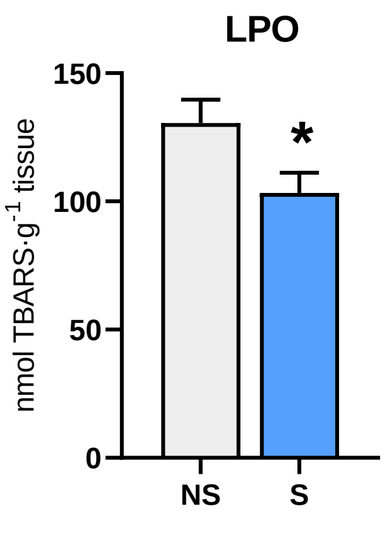




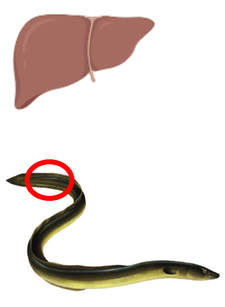
Posterior skeletal muscle







Induced swimming:



GSH = enhanced antioxidant status

GSH/GSSG ratio

LPO levels

stable cellular antioxidant status

No effect on the oxidative stress biomarkers analyzed in the **anterior skeletal muscle**.

CONCLUSIONS

- ✓ **Species-specific** swimming conditions may **strengthen cellular mechanisms** to counteract oxidative stress;
- ✓ **Swimming activity** **enhanced redox status** in **liver** and **posterior skeletal muscle**;
- ✓ This study highlights the importance of **suitable swimming conditions** in anguilliform species.

Funding:

FCT (UIDB/04423/2020 and UIDP/04423/2020).
Carlos Espírito-Santo PhD grant (**FCT**, UI/BD/150911/2021).