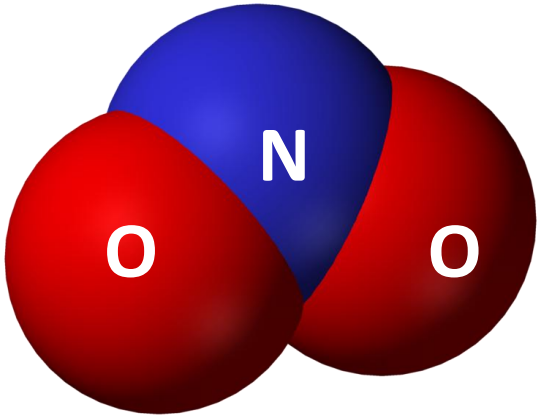
Interpopulation variation in nitrite tolerance in the eastern mosquitofish (*Gambusia holbrooki*)



Oriol Cano-Rocabayera[1,2], Kevin J Kroll[2], Jonas Jourdan[1], Nancy D Denslow[2]

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JOHANN WOLFGANG GOETHE
UNIVERSITÄT
FRANKFURT AM MAIN

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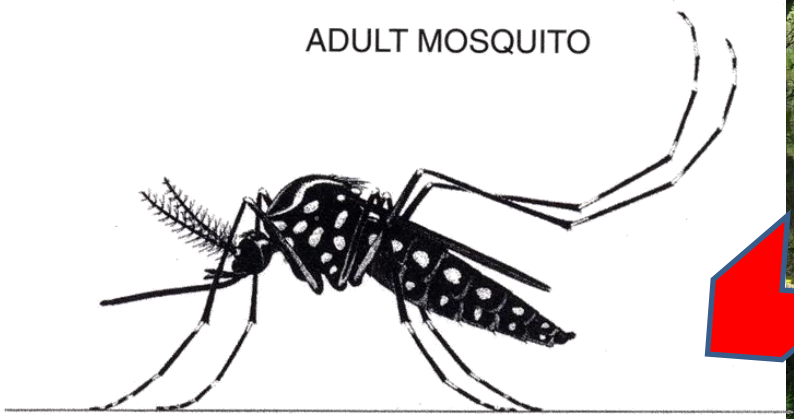
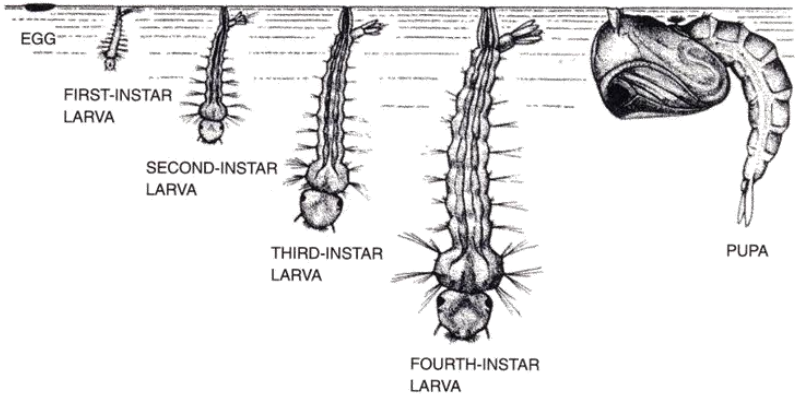
1. INTRODUCTION

Assessing Contaminant Effects in Ecosystems with Multiple Stressors

1. INTRODUCTION

Eutrophication



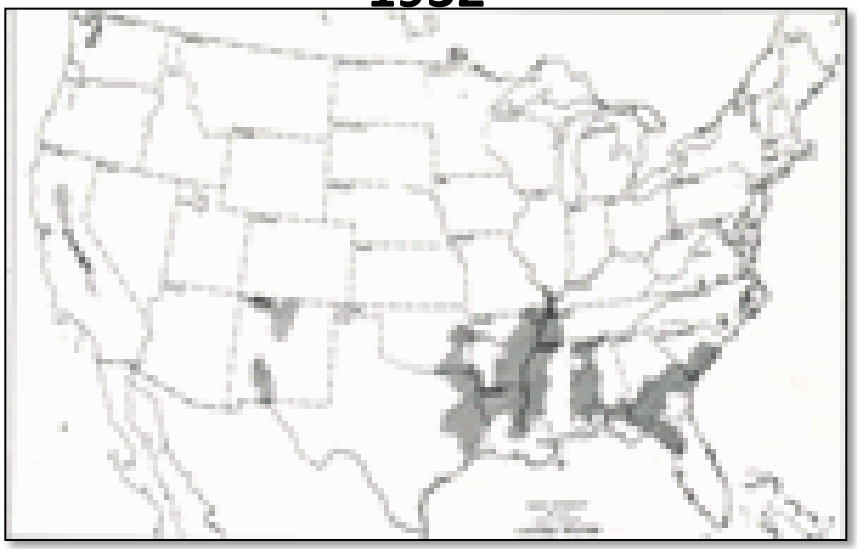


1. INTRODUCTION

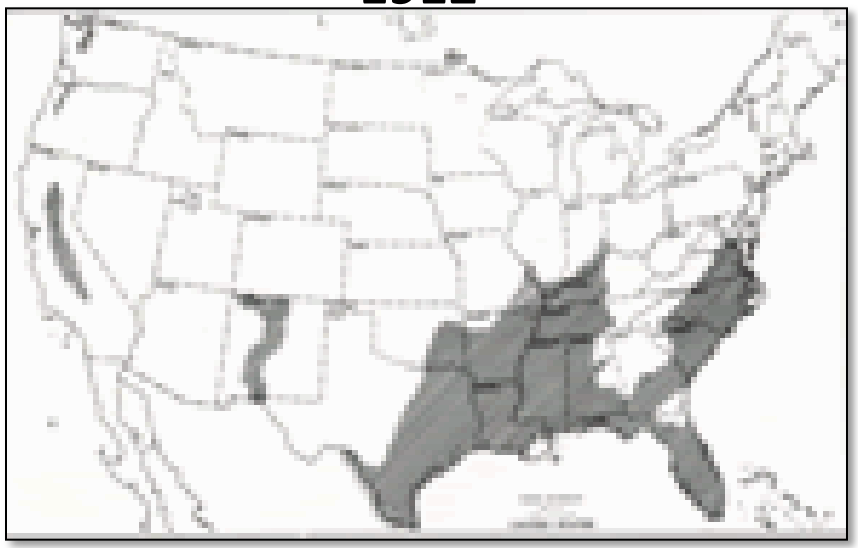
Malarious area of the United States (WHO, 1969)

1882

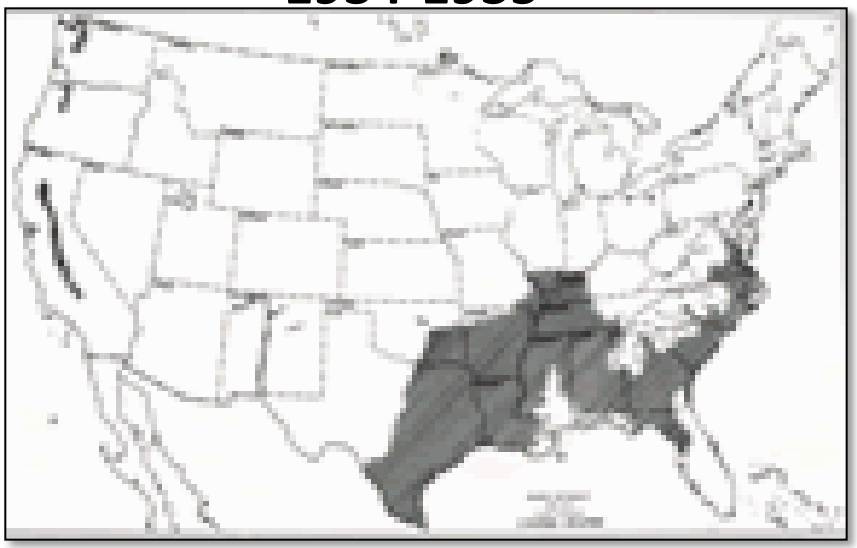
1932



1912



1934-1935



1. INTRODUCTION

Gambusia holbrooki **(Girard, 1859)**

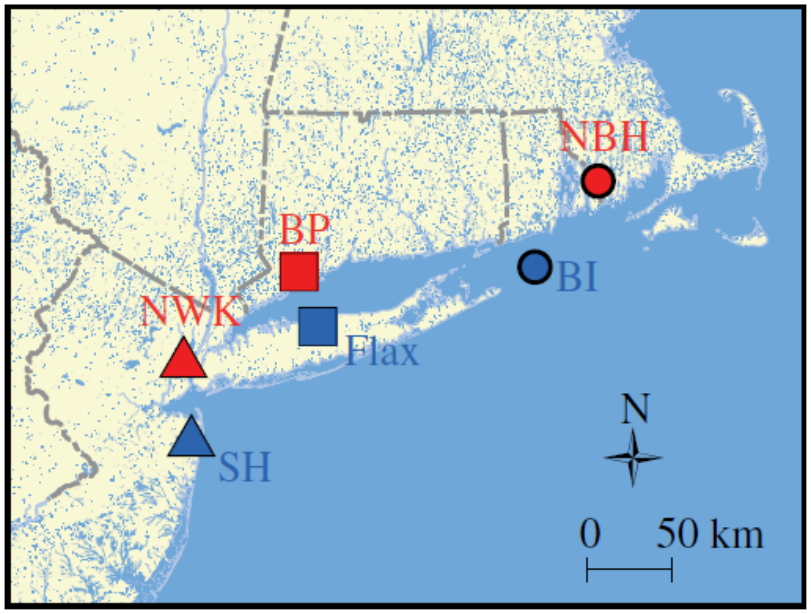
Family Poeciliidae

ovoviviparous

Sexual dimorphism, females < 60 mm, males < 35 mm

Omnivorous species, eurihaline (< 20 ‰) and eurithermal

1. INTRODUCTION

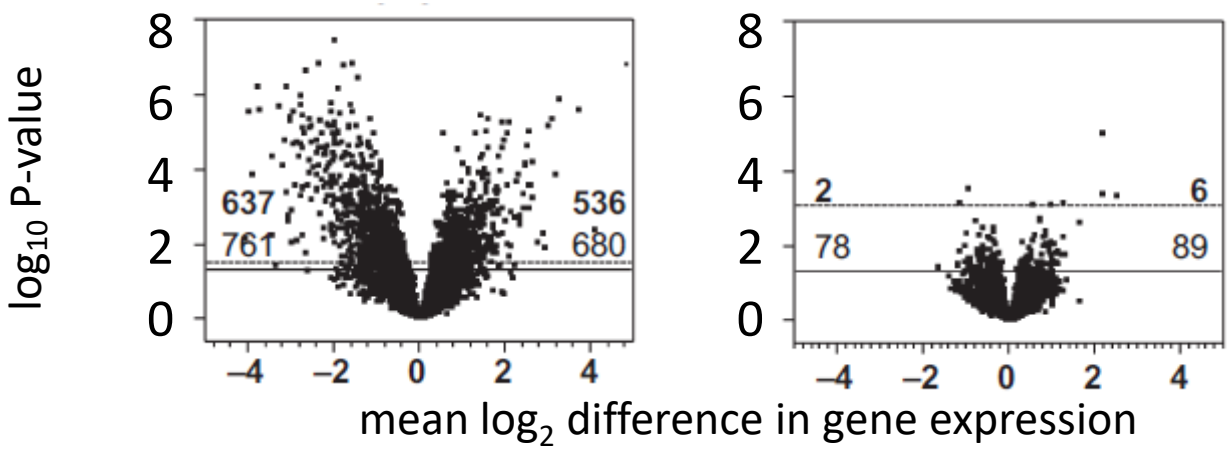


Fundulus heteroclitus

Whitehead et al., 2012
Proc. R. Soc. B

Sensitive populations

Tolerant populations

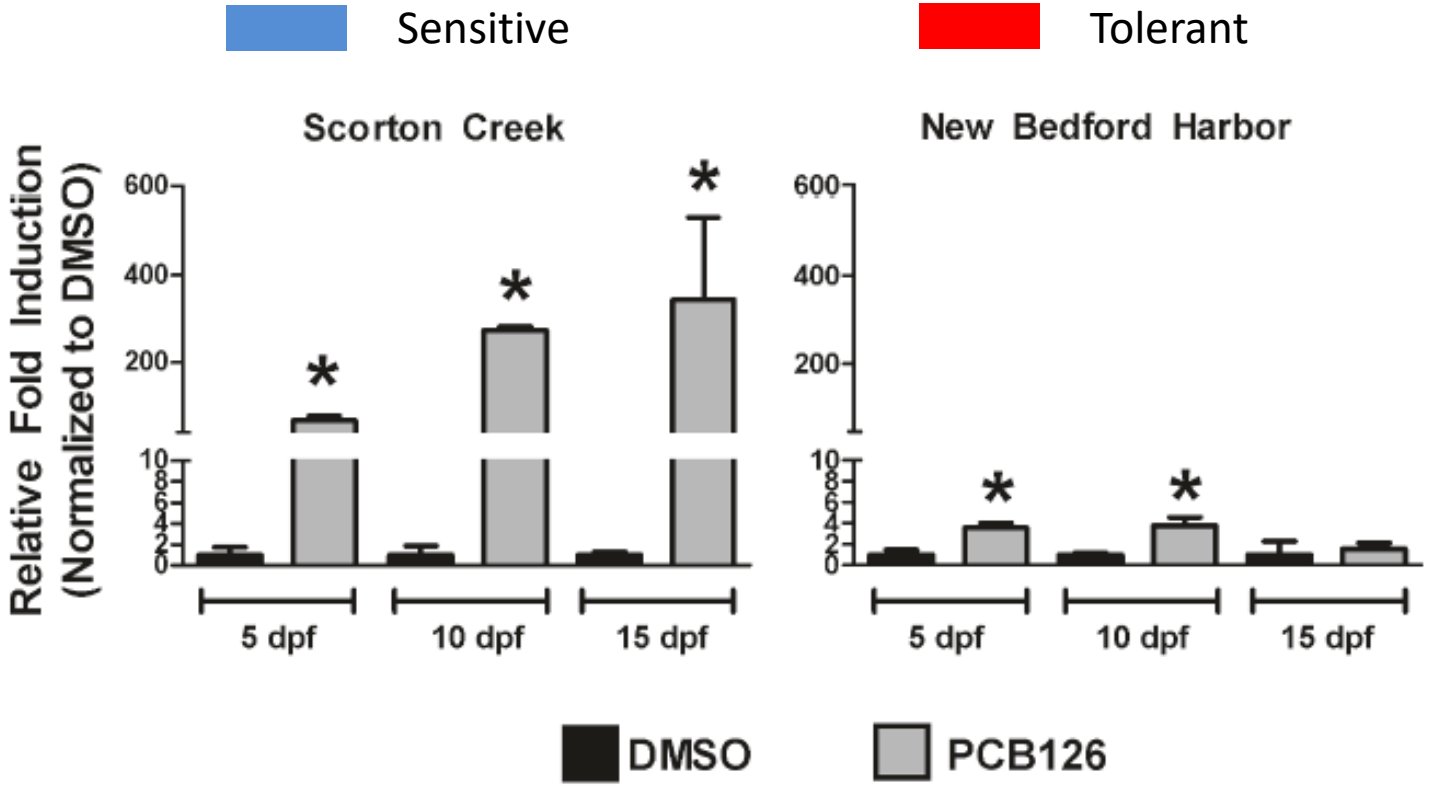


Whitehead et al., 2010
Molec. Ecol.

1. INTRODUCTION

Oleksiak et al., 2011 *BMC Genomics*

Fundulus heteroclitus



2. TOXICITY NITRITE EXPOSURE

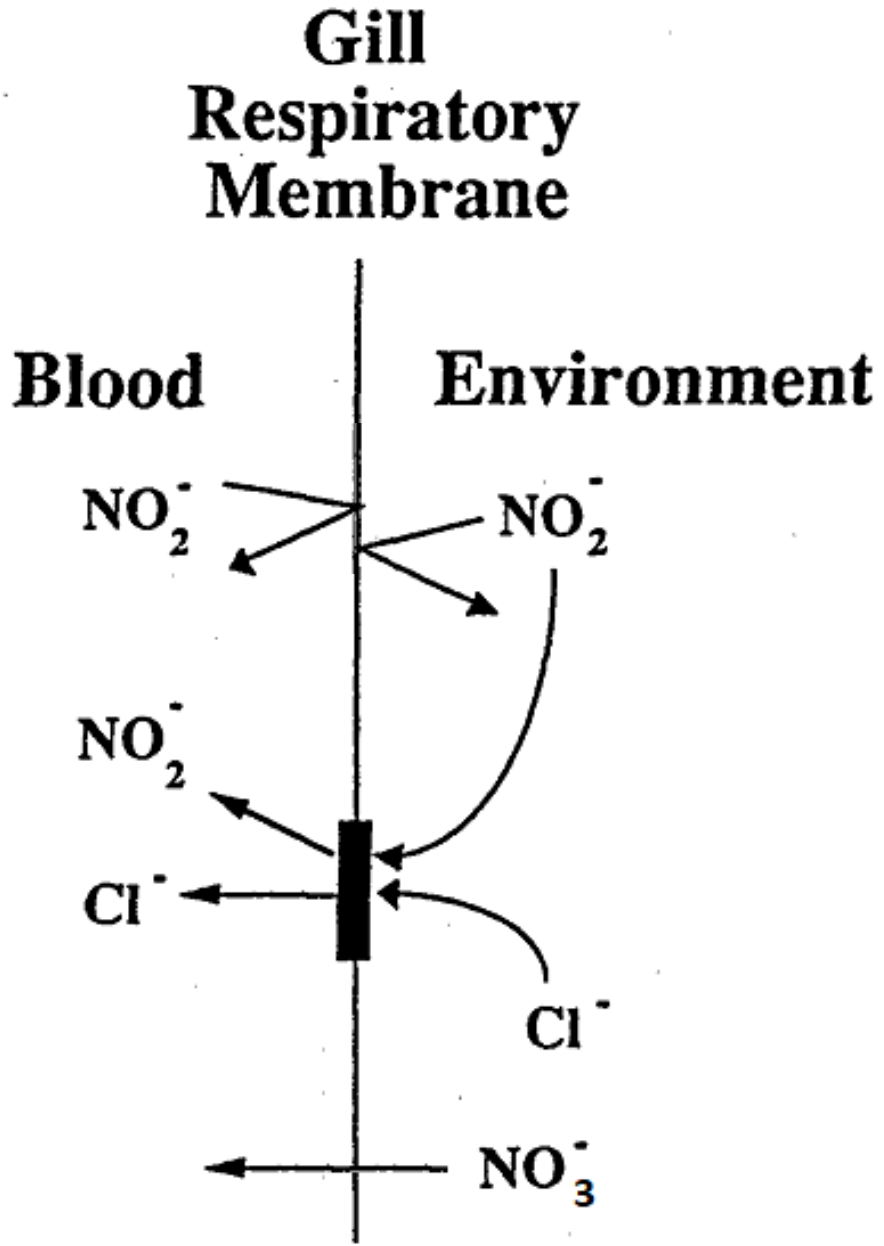
Toxicity of nitrIte

NH_3

NO_2^-

NO_3^-

2. TOXICITY OF NITRITE EXPOSURE



3. OBJECTIVES AND HYPOTHESES

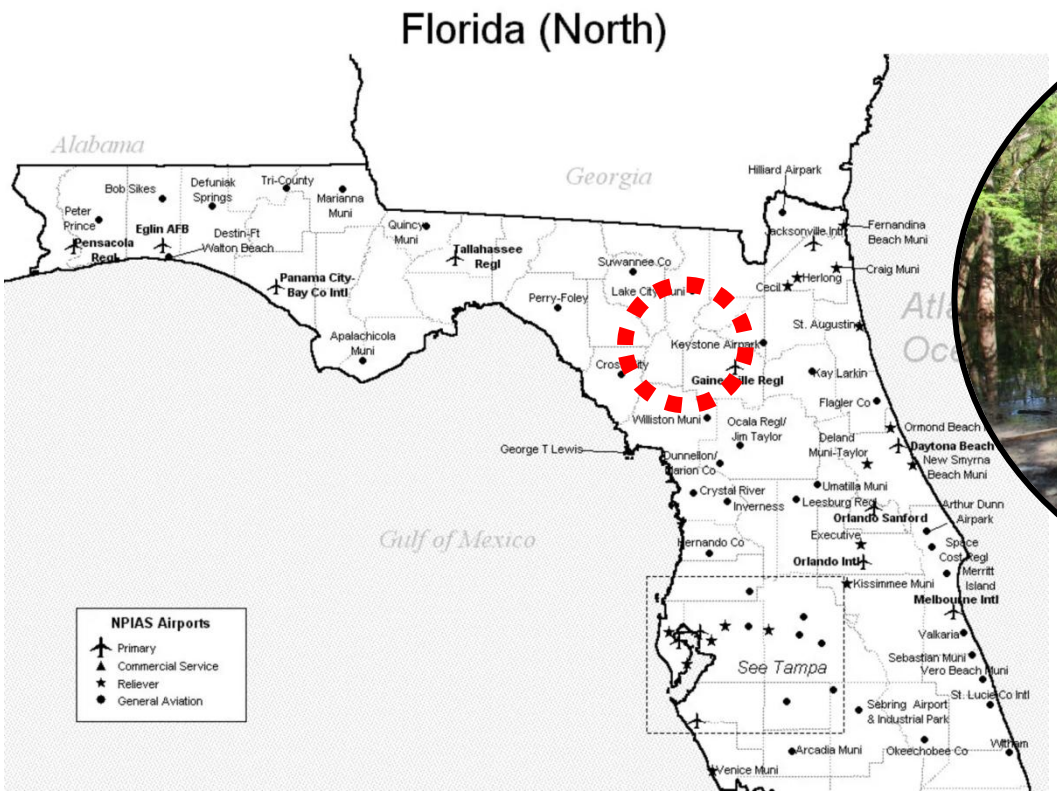
General objective

Assess the toxicity of nitrite on eastern mosquitofish (*Gambusia holbrooki*) on individuals from 3 different populations at varying background nitrogen pollution.

Main hypothesis

Biomarkers in fish from polluted sites will show less shifted responses between lab-exposed treatment and controls due to evolved mechanisms of tolerance in these phenotypes.

4. METHODOLOGY: EXPER. DESIGN



NO_3^--N mg/l (1998 – 2006, FL Dpt. Environ. Protection)

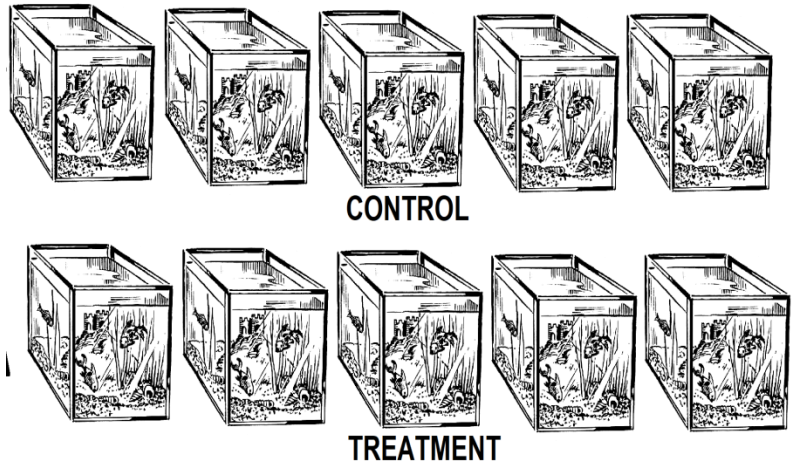
Poe springs	0.2 – 0.5
Owens springs	> 3
Ruth springs	> 3

Site 1 Site 2 Site 3

0 Nitrate-N 4
(mg/l)

- Wild-caught fish.
- 3 months acclimation in the lab at clean freshwater.
- Daily feeding.

4. METHODOLOGY: EXPER. DESIGN



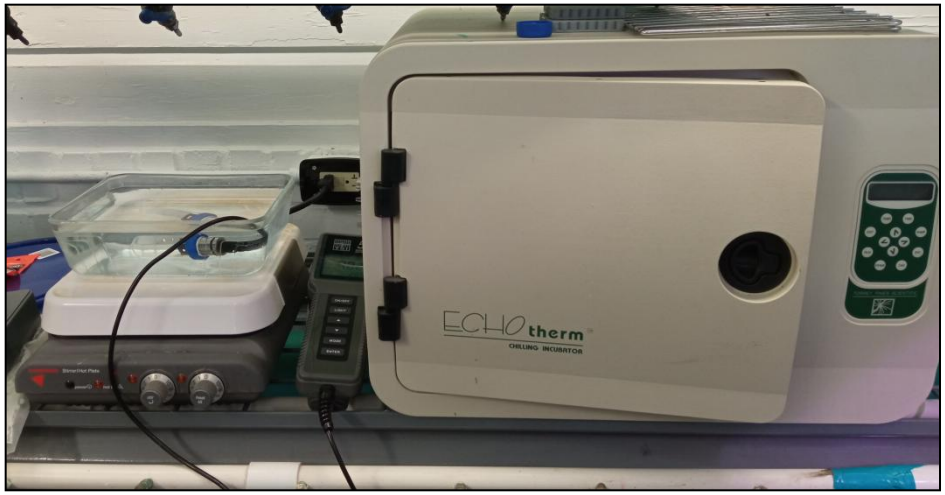
< 0.01 mg/l NO2 – N

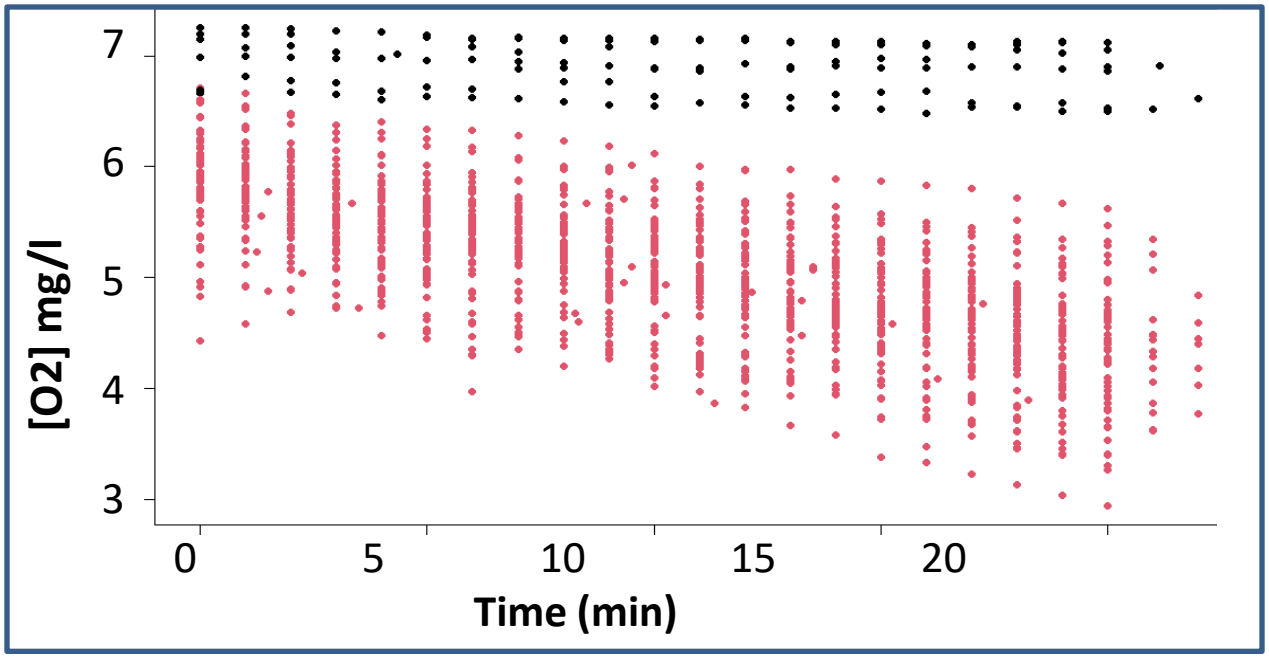
0.3 mg/l NO2 – N

NO_2^- EXPERIMENT, 10-day exposure

4. METHODOLOGY

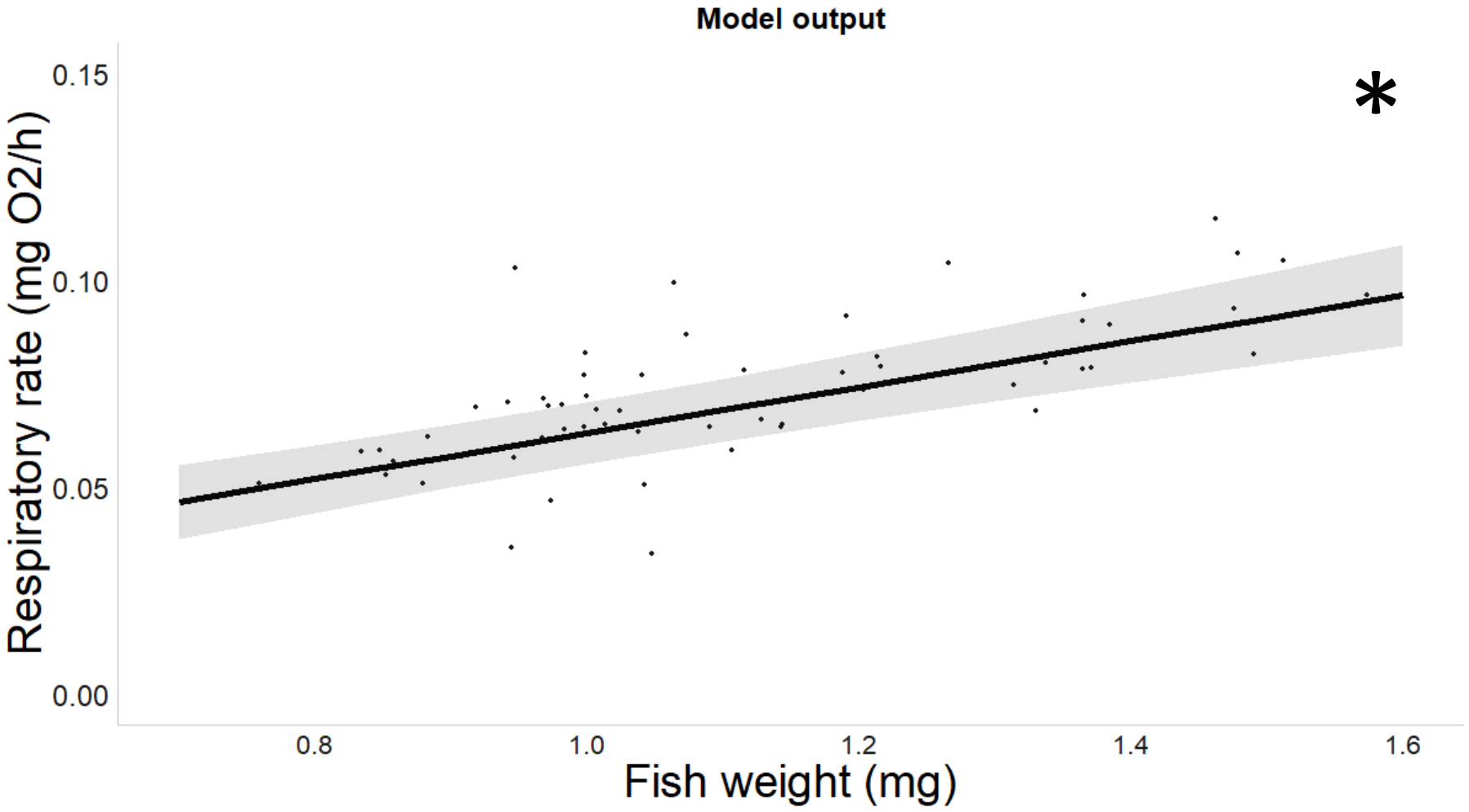
Respiratory rates ('metabolism')





5. RESULTS AND DISCUSSION

Respiratory rates ('metabolism')



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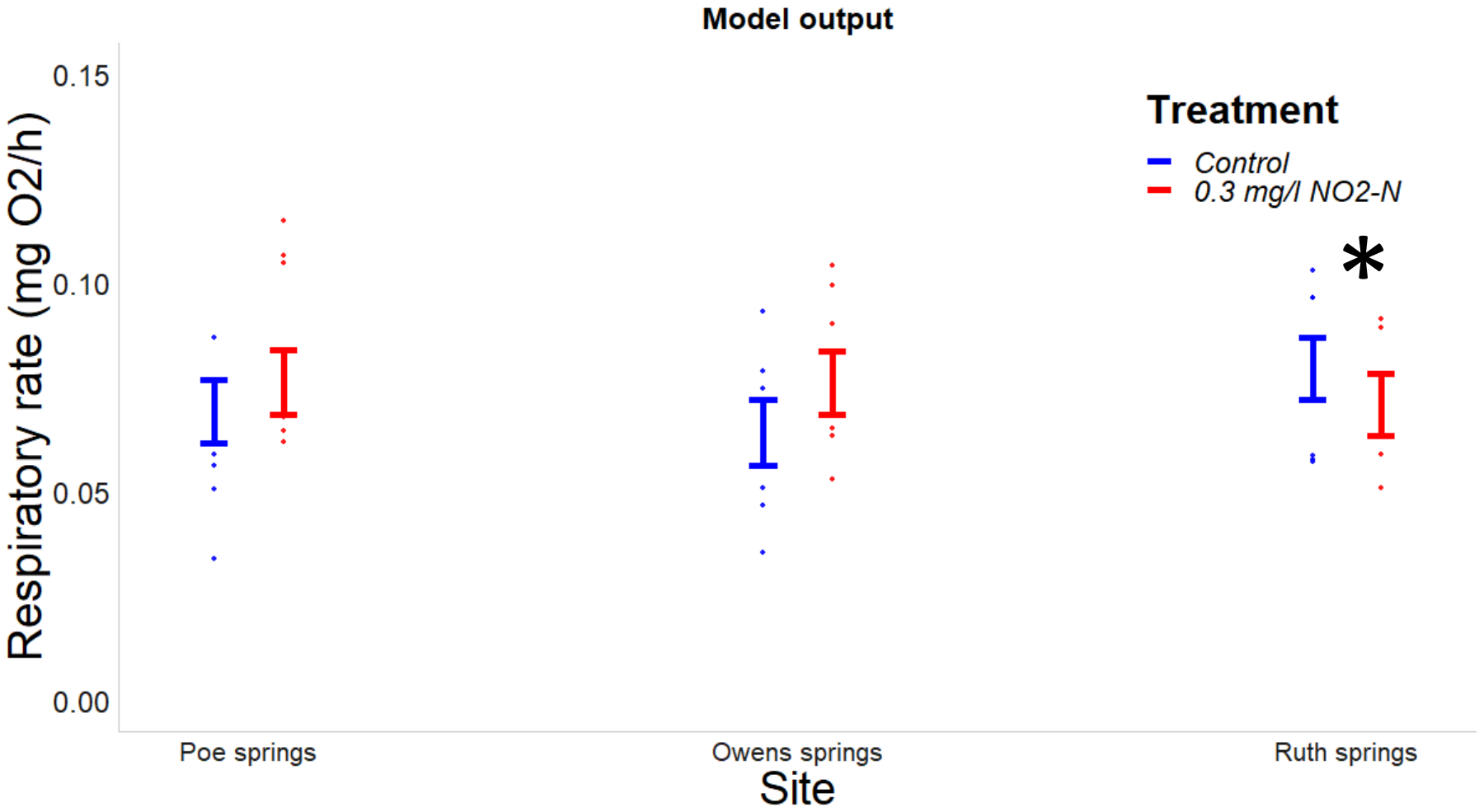
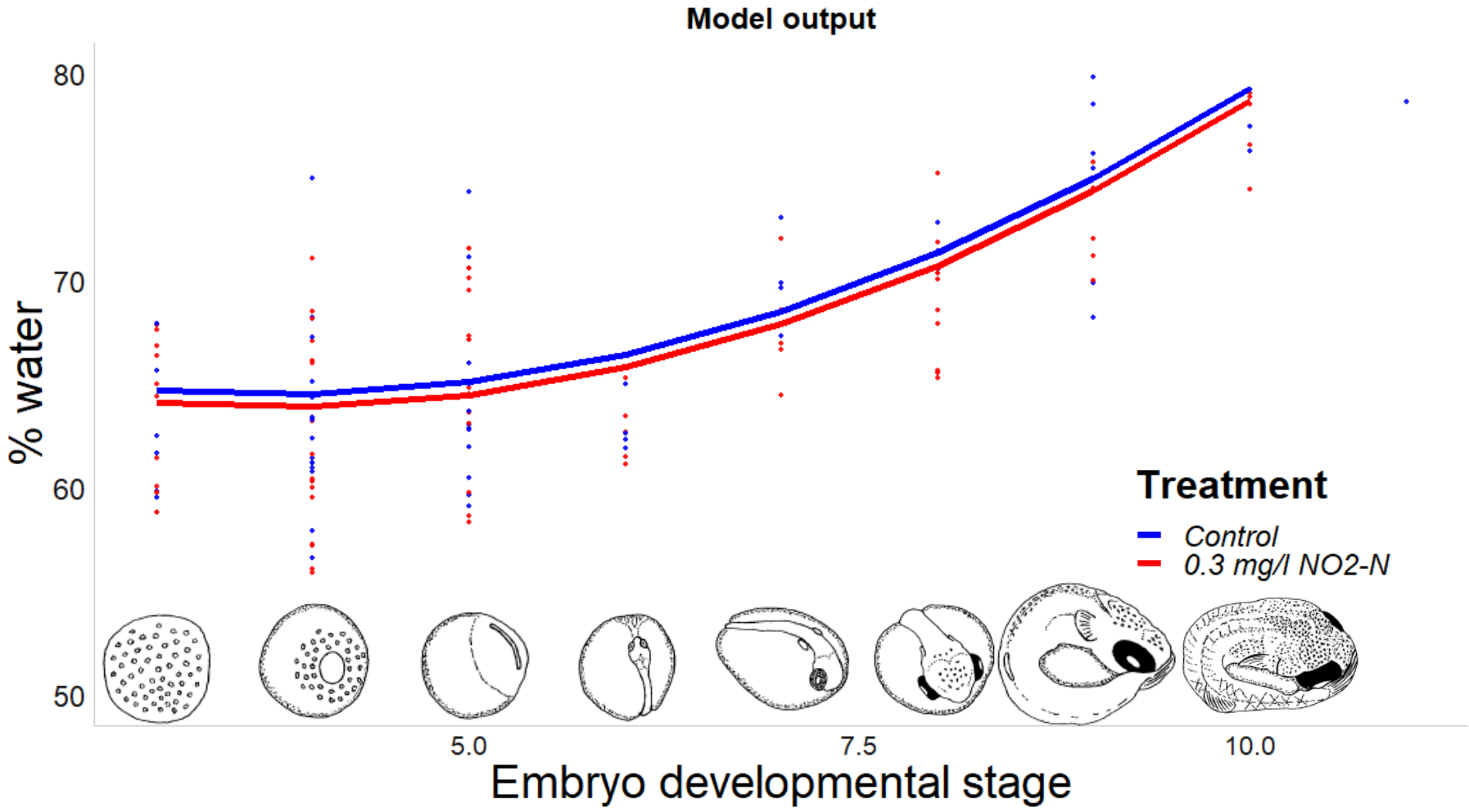


5. RESULTS AND DISCUSSION

Life history traits



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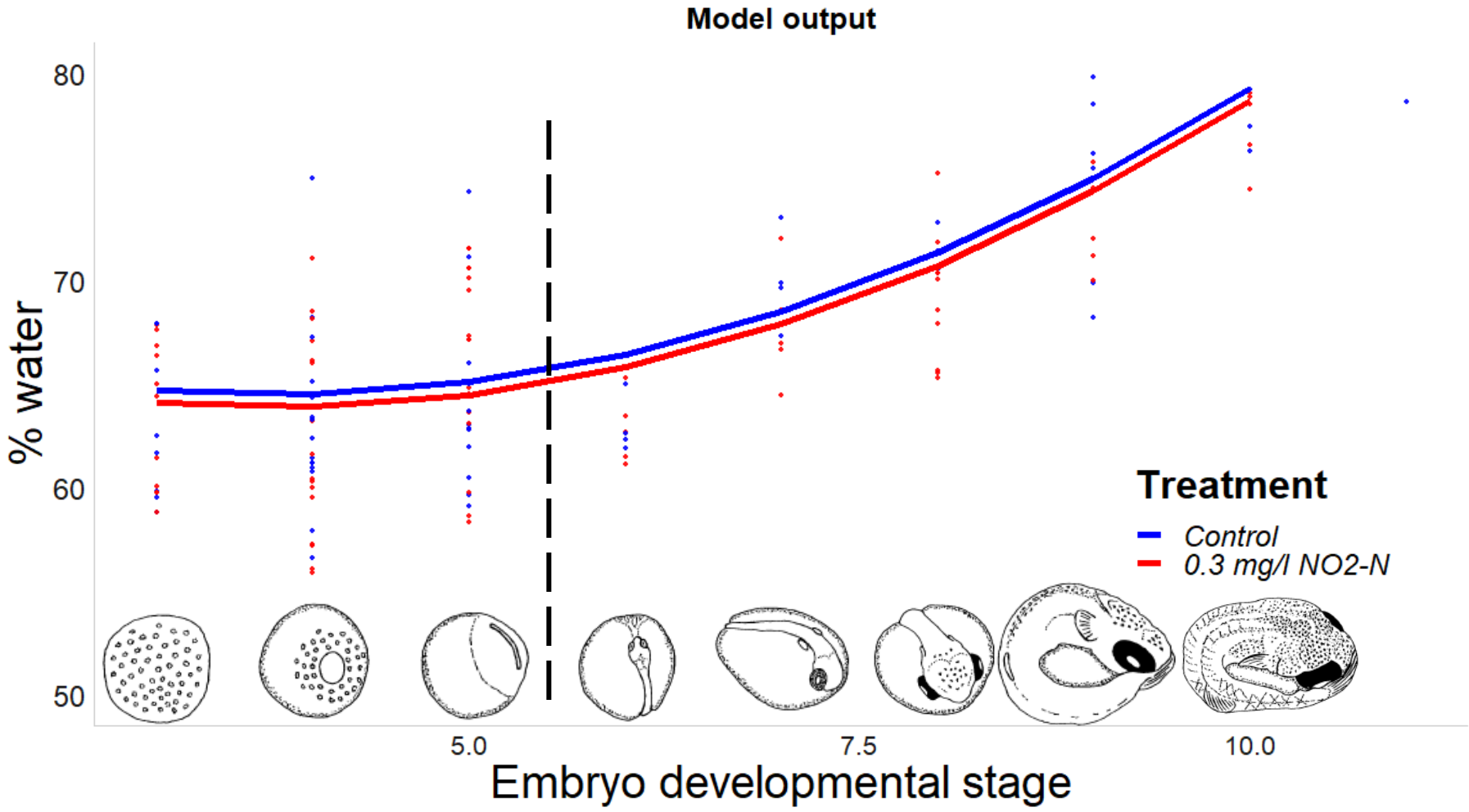
Life history traits



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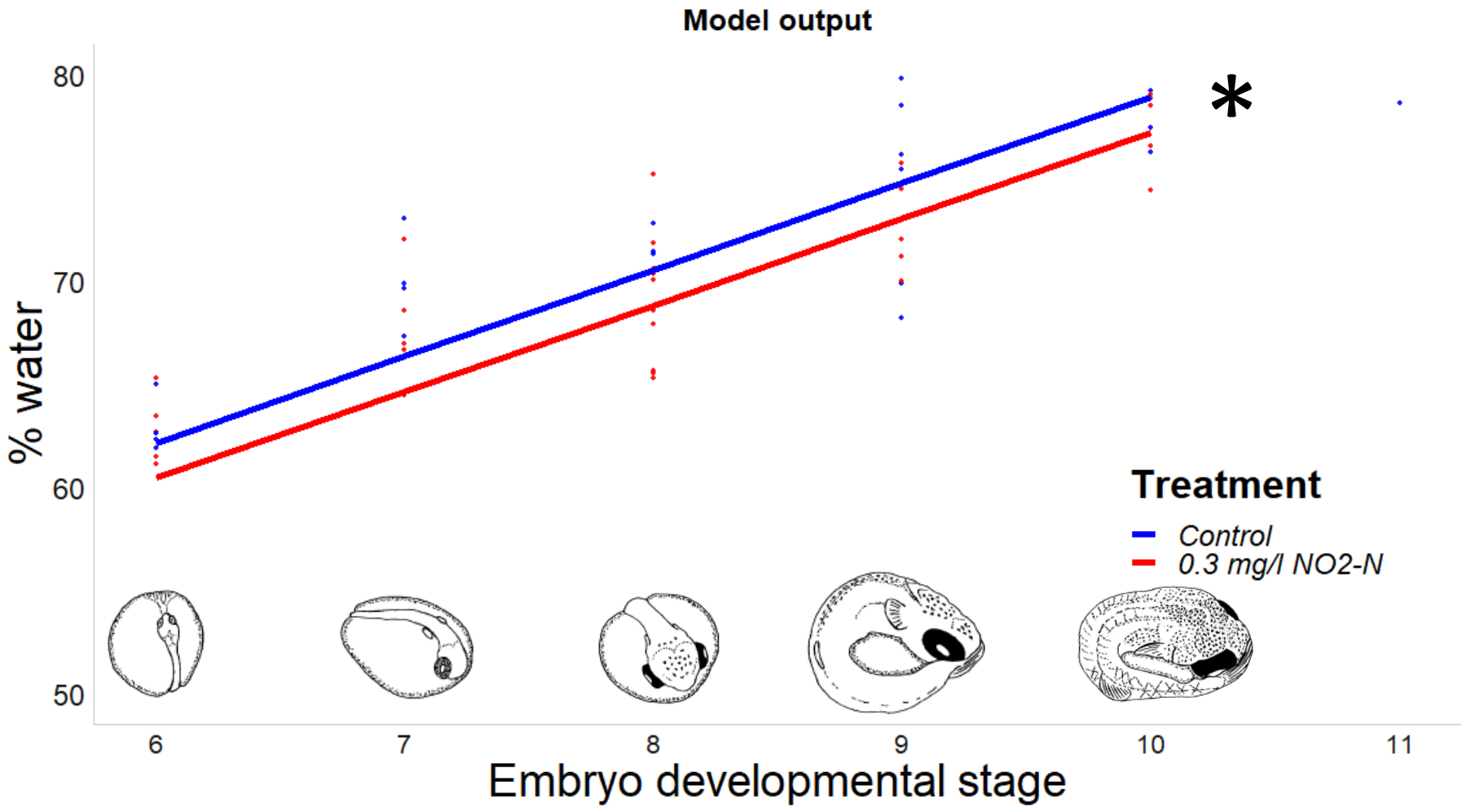

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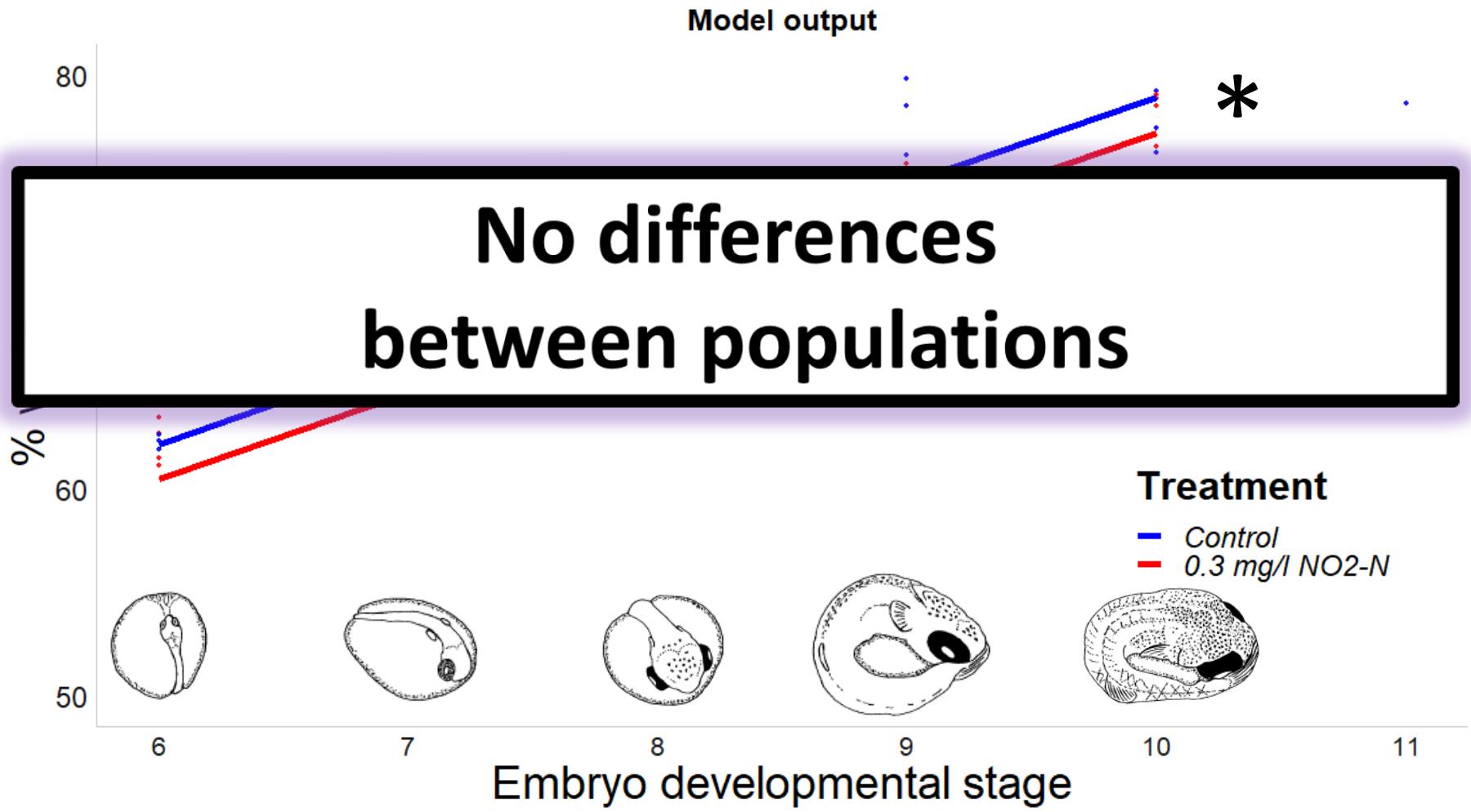
Life history traits



No differences between populations

ACKNOWLEDGEMENTS

SETAC NORTH AMERICA
43RD ANNUAL MEETING

University of Florida

DENSLOW lab

Goethe Universität Frankfurt (Germany)

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IDAEA-CSIC (Spain)

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THANK YOU FOR YOUR ATTENTION

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