Estuarine keystone species in a changing world:

how do potential vulnerable stages of fiddler crabs respond to global warming and acidification?

Juan C. F. Pardo[1,2] *

Supervisor: Tânia M. Costa[1,2]

Co-supervisor: Stefano Cannicci[3]

[1]Universidade Estadual Paulista (UNESP), Instituto de Biociências (IB), Campus do Litoral Paulista

[2]Programa de Pós-graduação em Ciências Biológicas (Zoologia) - UNESP, IB, Campus de Botucatu

[3]The Swire Institute of Marine Science, School of Biological Sciences, The University of Hong Kong

*pardojcf@yahoo.com.br

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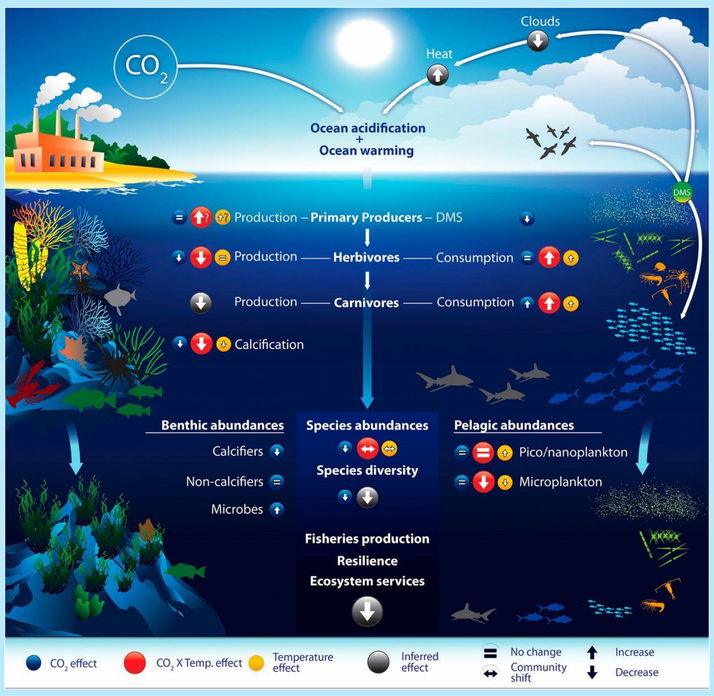
BACKGROUND

- **Anthropogenic climate change** affects the ecosystem structure and functioning;
- Calcified **ectotherms** are among the **most sensitive groups** in a changing environment;
- Predicted effects of global warming and acidification on **estuarine and coastal organisms** are complex.



Nagelkerken, I. and Connell, S.D., 2015. Global alteration of ocean ecosystem functioning due to increasing human CO2 emissions. PNAS, 112(43), pp.13272-13277. Copyright (2015) National Academy of Sciences.

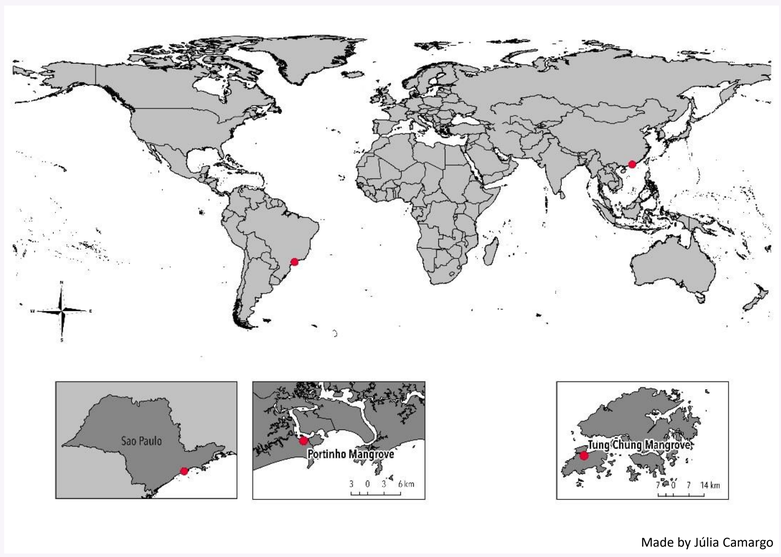
MAIN OBJECTIVE

Evaluate how potential vulnerable stages of estuarine ectothermics respond to global warming and acidification predictions.

SELECTED RESULTS

Maternal status elicits **species-specific responses to warming** in fiddler crabs

The fiddler crabs *Leptuca thayeri* and *Gelasimus borealis* were used as model species to verify if ovigerous females are more sensitive to warming than non-ovigerous.



Study sites: Portinho mangrove, Praia Grande, SP, Brazil – *L. thayeri* and Tung Chung mangrove, Hong Kong, Republic of China - *G. borealis*.

Ovigerous female *L. thayeri* with eggs at initial stage of development followed by the embryo development until the late stage before hatchling.

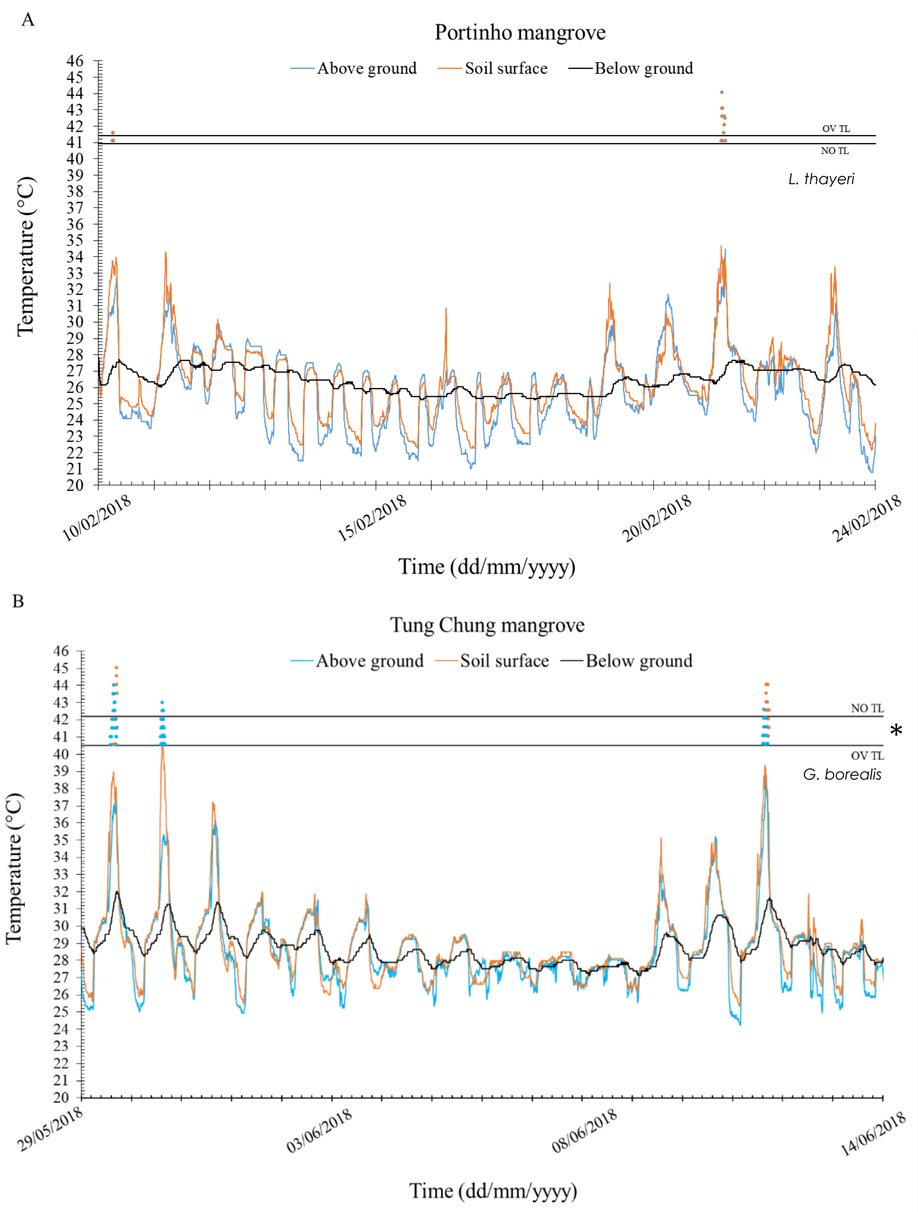
Combined effect of predicted costal warming and acidification in the **embryonic development** of the fiddler crab *Leptuca thayeri*

Development rate =

Survivorship =

Volume =

Ammonia excretion =



Mean field environment temperature of the fiddler crab habitats on (A) Portinho mangrove, Brazil, (10/02/2018-24/02/2018) and (B) Tung Chung mangrove, Hong Kong, (29/05/2018-14/06/2018) at the different zones: soil surface and above and below ground. Black lines represent thermal limits (TLs) of each species (*L. thayeri* – Portinho mangrove; *G. borealis* – Tung Chung mangrove) and reproductive status (NO: non-ovigerous females/OV: ovigerous females). Dots are the extremes values above species' TLs observed in all loggers from each zone and day. Asterisks mean significant differences between reproductive status. Estimations were made with temperature loggers (iButtons).

Experiments under IPCC (2014) predictions (RCP 8.5) of temperature and pH for the late 21st century
(Symbols based in the Introduction Figure)

EXPECTED CONTRIBUTIONS

- Bridge some gaps concerning estuarine organisms in a changing world, an understudied group in the South Atlantic;
- Support theoretical models and future studies on ectotherms and climate change;
- Communication of our results to general public and decision-makers.

Are you interested on more information about fiddler crabs? Enjoy this informative video from New Atlantis WILD!

*'Barcode Scanner' is a good reading QR code app!

ACKNOWLEDGES