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Impacts of climate/environmental change on the fauna: an integrative approach

Coordinator:

Carlos A. Navas (IB-USP)

Principal Investigators:

Ariovaldo P. Cruz-Neto (UNESP-RC)

Fernando R. Gomes (IB-USP)

Renata Guimarães Moreira (IB-USP)

Effects of global climate change of the Brazilian fauna: a conservation physiology approach 2008/57687-0

- 54 scientific papers indexed in SCI
- 50+ conferences in Brazil and abroad
- 23 grants for national and international collaboration

- 5 undergraduate students
- 25 graduate students
- 5 main international collaborators
- 8 main national collaborators
- 3 technicians

What the program meant to the project

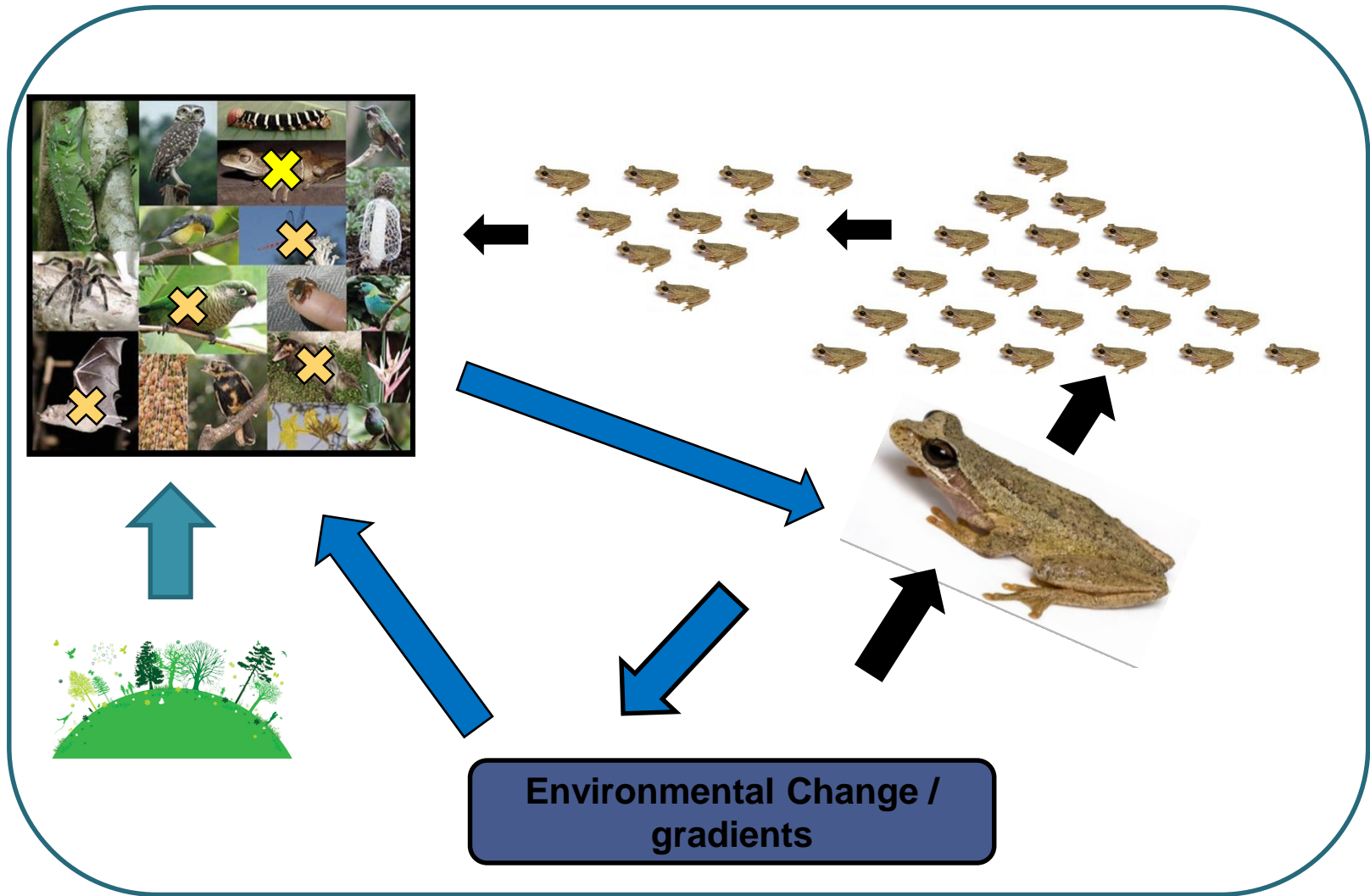


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- Promoted disciplinary integration and novel interactions
- Modulated questions under the light of those interactions
- Helped to achieve leading roles in international developments

Emerging Frontiers: Macrosystem. Quantifying climate-forced extinction risks for lizards, amphibians, fishes, and plants. Coordenador Barry Sinervo. University of California, Santa Cruz. NSF US\$2,000,000

- Enormous possibility to decrease a serious problem (next slide)

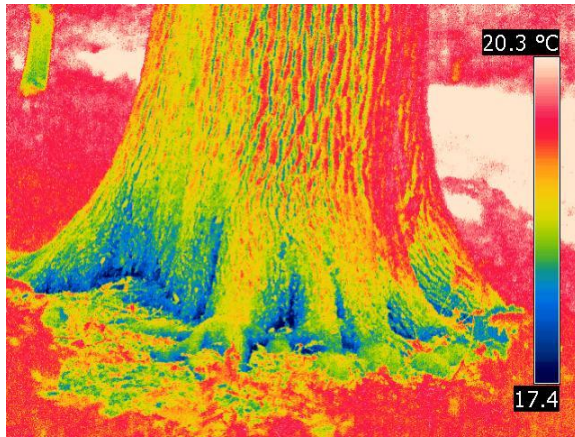
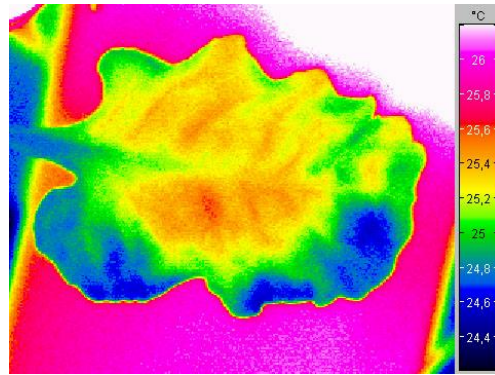


Climate + Biodiversity + Framework IN SCI n= 49 (2000 – 2015)

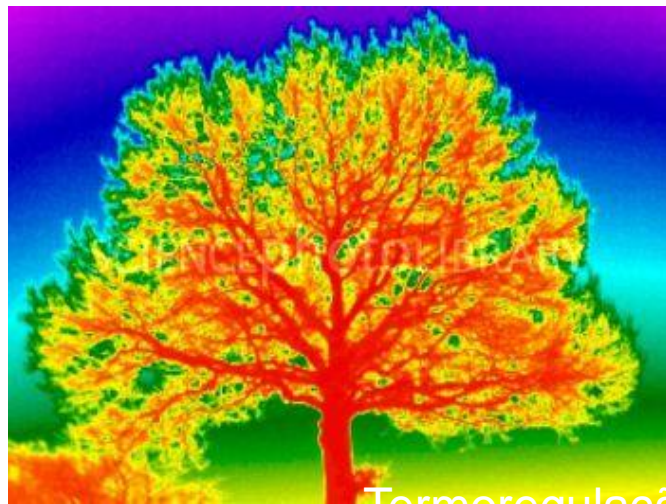
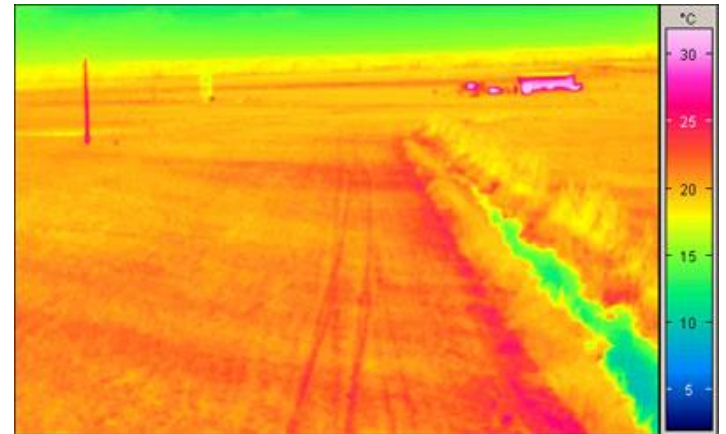
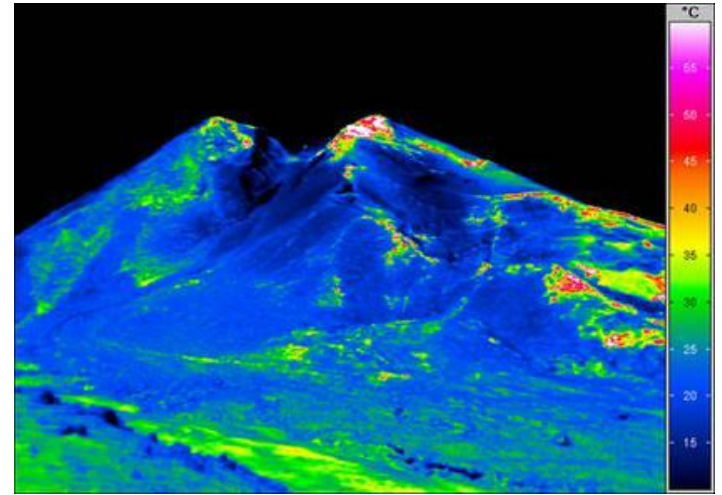
Five key questions leading the project

1. How altered climate reflect into changes perceived at *scales* compatible with the microhabitat of individual animals?
2. What are the scope, processes and mechanisms responsible for *physiological adjustment* to climate change?
3. How these mechanisms may translate into patterns of faunal biodiversity, *distribution and resilience*?
4. How physiological tools can be used for species-specific concerns of conservation in terms of *stress or immune arrest*?
5. What are the best lineage-specific physiological data to feed *mechanistic models* of climate change impact on the fauna?

Micro



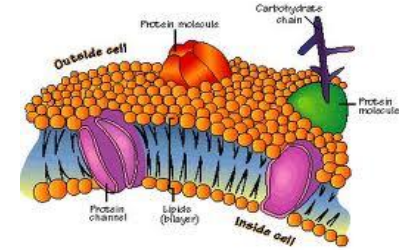
Macro



Termoregulee

Temperature and development

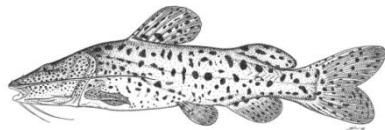
- Thermal effects on metabolism, cell membrane organization and development



- Thermal tolerances

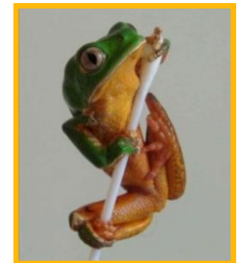
Interaction climate-habitat fragmentation

- Climate, habitat fragmentation and physiology in rodents and bats from different Brazilian biomes.



- Endocrine control and reproductive blocking in migrating fish exposed to dams: The *surubim do Paraíba*

- Microclimate, habitat fragmentation and cutaneous microbiota in anuran amphibians.



Temperature and physiological tolerance

- Climate, stress and physiological tolerance in endemic birds



- Critical temperatures in anurans and arthropods in terrestrial Brazilian biomes

- Tolerance to freezing in anurans

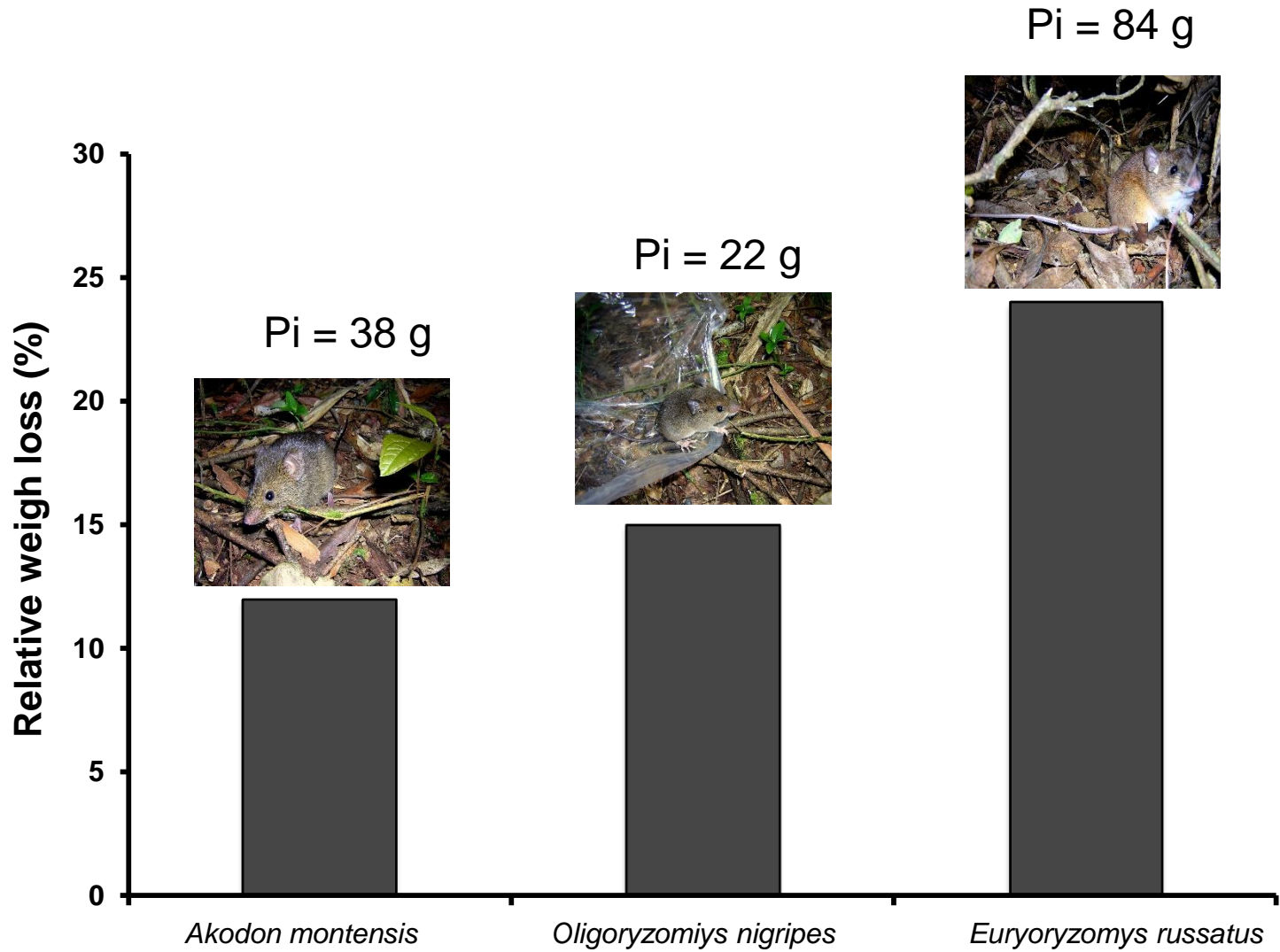


Aridization and physiological tolerance

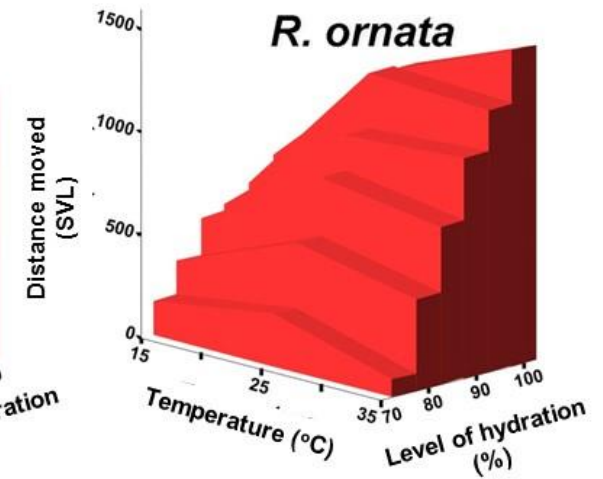
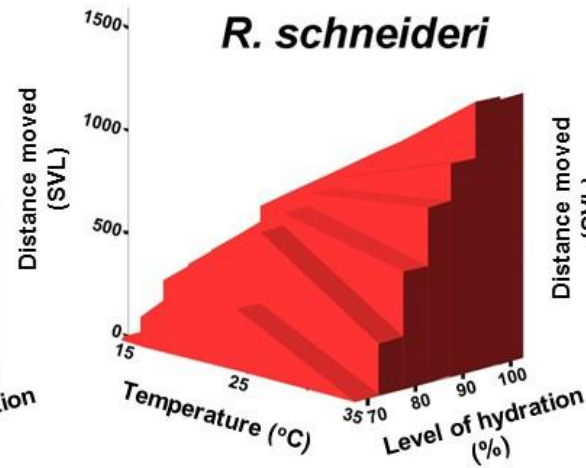
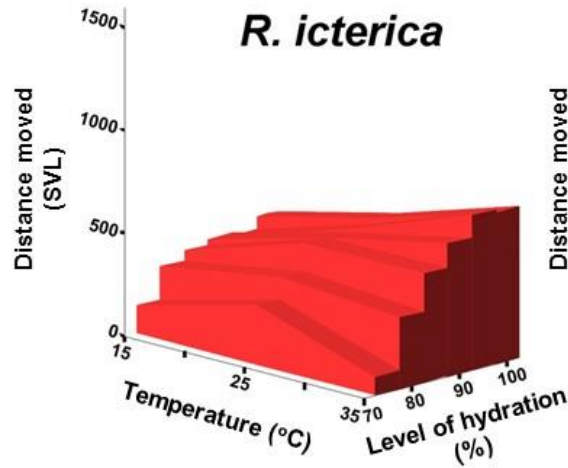
- Aestivation physiology in Caatinga anurans



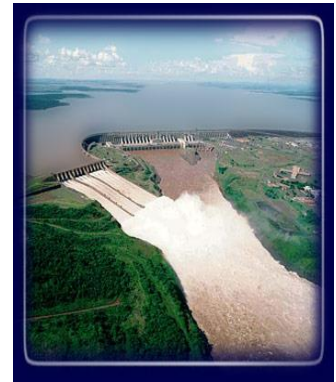
How mammals respond to changes in water availability?



How amphibians respond to combined changes in temperature and water availability?



Why river fish do not reproduce when the reproductive migration is blocked?



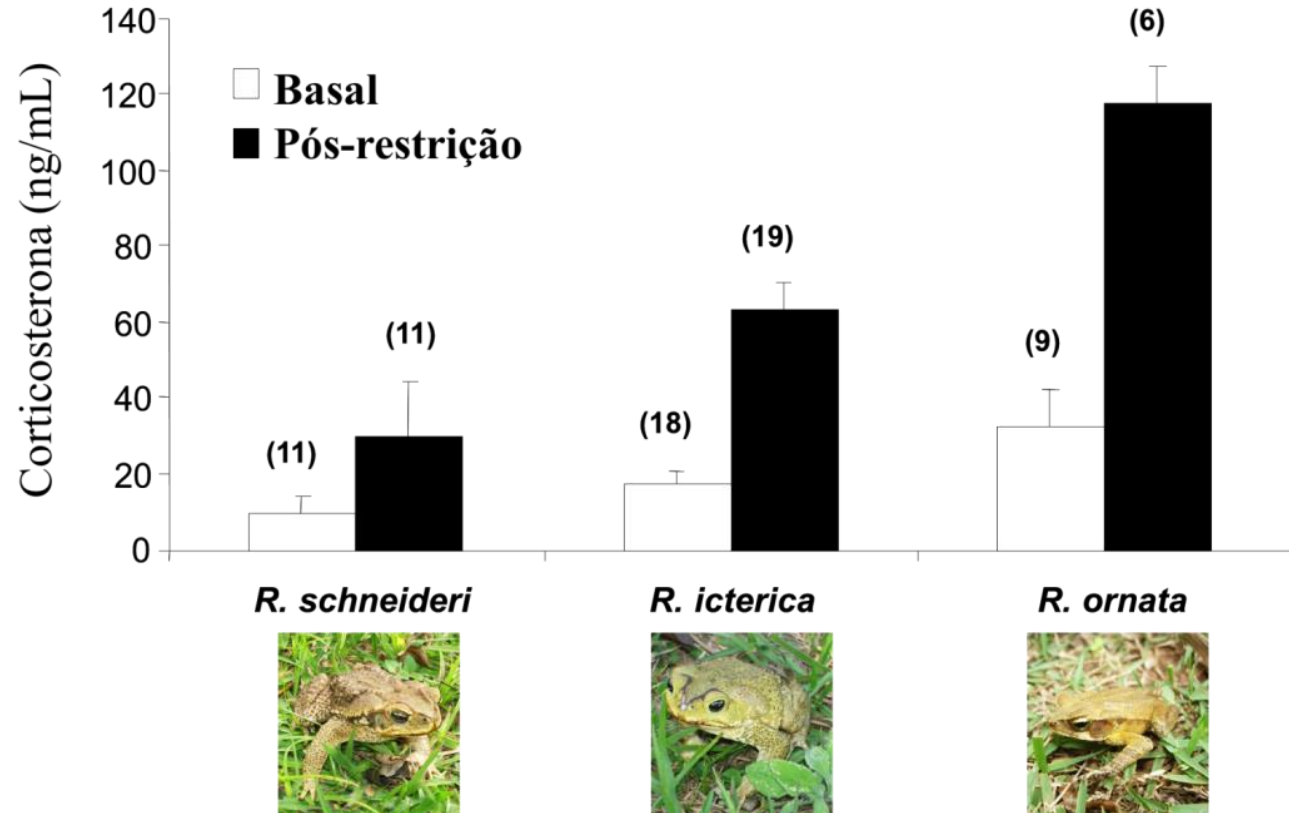
Environmental changes



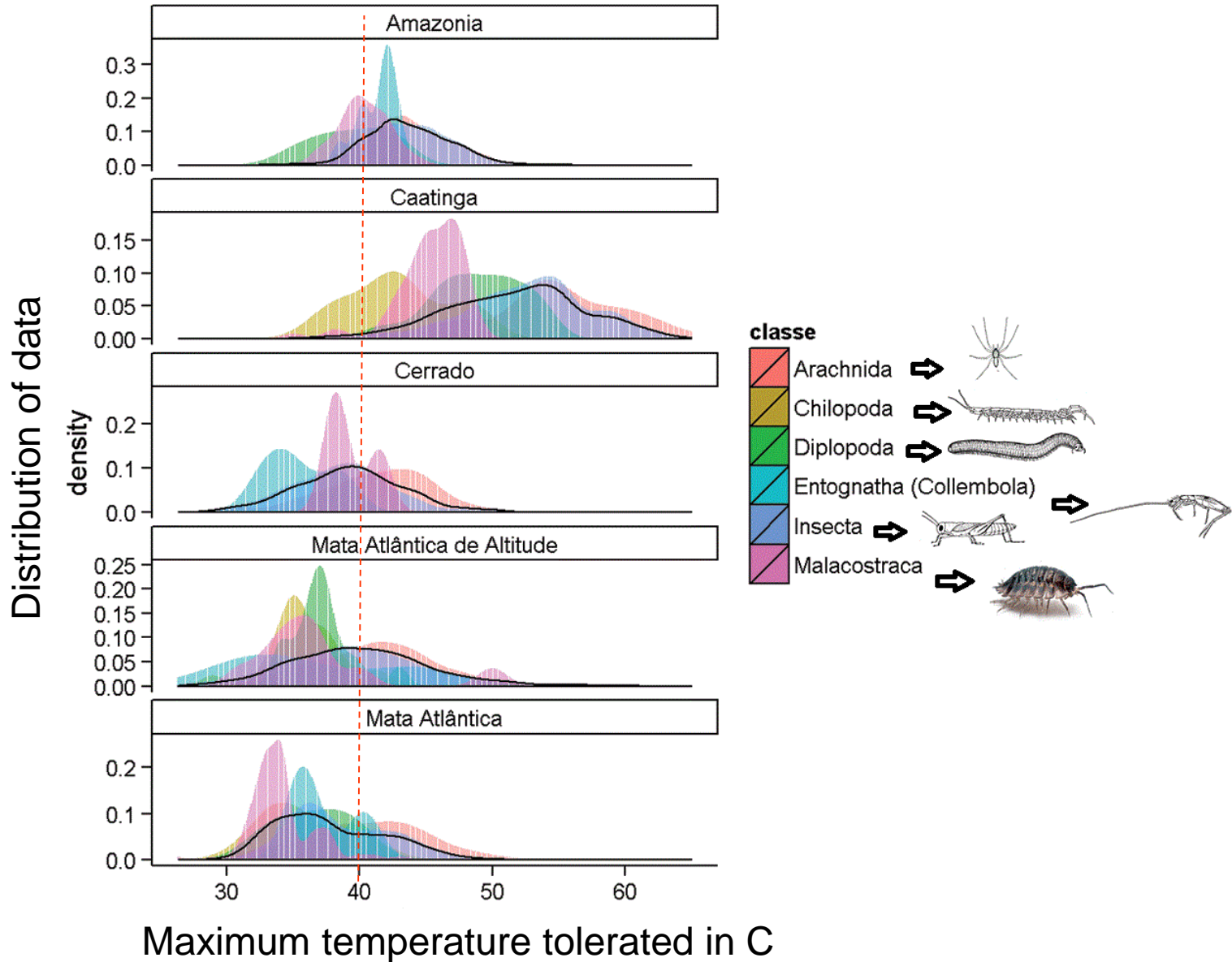
Regulation of the biomembrane fluidity
Immune response
Synthesis of hormones

Reproduction
Egg quality
Larval survival

Do environmental and climatic changes affect stress responses?



Are different Brazilian terrestrial faunas fundamentally different in climate tolerance?





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