Sphenodon punctatus
Images © JamesReardon.org

Book of Abstracts
Oral Presentations

WCH9

9TH WORLD CONGRESS OF HERPETOLOGY

5-10 JANUARY 2020 • DUNEDIN • NEW ZEALAND

Conservatism and plasticity in the ecophysiology of a lizard across a steep environmental gradient

Carretero M[1], Serén N[1], **Megia-Palma R[1]**, Simčič T[1], Žagar A[1,2]
[1]CIBIO/InBIO, Research Centre in Biodiversity and Genetic Resources, [2]NIB, National Institute of Biology

Ectotherms ranging across steep environmental gradients may exhibit adaptive/plastic responses, conservativeness or both. We analysed three physiological parameters of ecological relevance for lizards: 1) preferred temperature (Tpref), correlating with physiological optima and displaying phylogenetic signal; 2) evaporative water loss (EWL), depending on size/shape but also on phylogeny; and 3) potential metabolic activity (PMA) a measure of respiratory electron transport showing altitudinal shifts in ectotherms. We examined the variation of these parameters in an outstanding model organism*, Gallotia galloti* (F. Lacertidae), a generalist species widely distributed in Tenerife Island 0-3700 m in <50 km air distance. We sampled eight populations, five on the dry southern and three on the humid northern slope, belonging respectively to two evolutionary lineages with current gene flow. We predicted that Tpref should decrease with altitude, EWL should be lower in the southern slope and PMA should be higher at high altitudes to compensate activity restrictions. Contrary to our predictions, no variation of Tpref across altitudes was found within the same slope but northern populations had lower Tpref; EWL was even more conservative varying only with size; and PMA was higher at mid altitudes (regardless slope). These unpredicted results suggest that evolutionary constraints act at variable timeframes; that lizard thermal and hydric ecophysiology may respond to similar climates in different ways depending on the group; and that better understanding of these systems requires metabolic studies. Findings are crucial to understand the role of physiology of ectotherms and to infer their capacity to respond to future climate changes.