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Symposium: Celebrating the contributions of Hal Heatwole and Hal Cogger to Herpetology

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Title: Herpetofaunal ecology (often) makes sense in the light of thermal physiology

Abstract:

An underlying rule in biology is that temperature affects physiological processes. This is salient in ectothermic organisms such as herpetofauna, which must cope with the challenges of changing body temperatures. The limitations associated with living in a dynamic thermal environment often translate into patterns of herpetofaunal distribution and behavior. As such, an understanding of thermal physiology and thermal environment are foundational to studies of herpetofauna. Beginning with a brief review of the contributions of Hal Heatwole and Hal Cogger to the field of thermal ecology, I explore how some methodologies and have changed over time with technological improvements to tackle emergent issues including invasion by herpetofauna and understanding of disease processes. I discuss recent applications of thermal ecology in my own research to understand and predict distribution of invasive herpetofauna, and to understand disease processes in wild populations. Specifically, I discuss the predictive value of critical thermal minima on current and future distributions of invasive lizards introduced to Florida, USA (*Leiocephalus carinatus* and *Furcifer pardalis*), obtained through different experimental and computational methods. I also discuss planned methodologies to assess the role of thermoregulation in combatting infection of *Batrachochytrium dendrobatidis* and *B. salamandrivorans* in plethodontid salamanders.