

1106-92-1555

John G Alford* (jalford@shsu.edu), Lee Drain Building, Room 420, 1900 Avenue I, Huntsville, TX 77340, and **William I Lutterschmidt**. *Costs and Benefits of Lizard Thermoregulation Revisited: From Conceptual to Computational Models*.

Behavioral thermoregulation in ectothermic vertebrates has been an area of major theoretical interest and has inspired a diversity of discussions among scholars of ecology, physiology and evolutionary biology. This research has generated many interesting mathematical problems. In this talk we discuss the mathematics of a conceptual model posed by Huey and Slatkin (1976) that is used to determine the thermoregulatory strategy that maximizes the energetic gain of a lizard. The model equations account for the cost and benefit of thermoregulation and thermal quality of habitat. Huey and Slatkin's conceptual model has served as a seminal work advancing energetic considerations of behavioral thermoregulation and established a theoretical foundation in thermal biology, but has not (to our knowledge) been investigated with a detailed quantitative analysis. We create mathematical formulas that mimic Huey and Slatkin's graphical depictions of the functions in their model equations and use numerical methods to analyze the model. Not only do our results illustrate both the utility and mathematical validity of Huey and Slatkin's qualitative analysis, but they also provide new insight into the theory of behavioral thermoregulation. (Received September 14, 2014)