



Thermal Adaptation: A Theoretical and Empirical Synthesis

By Michael J. Angilletta Jr.

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Temperature profoundly impacts both the phenotypes and distributions of organisms. These thermal effects exert strong selective pressures on behaviour, physiology and life history when environmental temperatures vary over space and time. Despite temperature's significance, progress toward a quantitative theory of thermal adaptation has lagged behind empirical descriptions of patterns and processes. In this book, the author draws on theory from the more general discipline of evolutionary ecology to establish a framework for interpreting empirical studies of thermal biology. This novel synthesis of theoretical and empirical work generates new insights about the process of thermal adaptation and points the way towards a more general theory. The threat of rapid climatic change on a global scale provides a stark reminder of the challenges that remain for thermal biologists and adds a sense of urgency to this book's mission.

Thermal Adaptation will benefit anyone who seeks to understand the relationship between environmental variation and phenotypic evolution. The book focuses on quantitative evolutionary models at the individual, population and community levels, and successfully integrates this theory with modern empirical approaches. By providing a synthetic overview of evolutionary thermal biology, this accessible text will appeal to both graduate students and established researchers in the fields of comparative, ecological, and evolutionary physiology. It will also interest the broader audience of professional ecologists and evolutionary biologists who require a comprehensive review of this topic, as well as those researchers working on the applied problems of regional and global climate change.

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Editorial Review

Review

"This book is broad in scope and far-reaching in its implications; every forward-thinking ecologist with some theoretical aptitude should consider what it offers."--*Bulletin of the British Ecological Society*

"I recommend this fascinating book without hesitation to anyone with an interest in thermal biology. Michael Angilletta's book is a delightful read and provides an interesting and detailed account of current knowledge in thermal biology. Students and researchers alike will find the volume useful and interesting and it should be an important, if not indispensable, introductory volume and reference for years to come."--*Integrative and Comparative Biology*

"Angilletta draws upon both classical work and the latest research to successfully provide a one-stop shop for everything from descriptive studies to selection experiments, game theory, optimality modeling, and quantitative genetics. It is the concise, balanced, and seemingly effortless manner in which this is achieved that makes this rather slim volume appealing."--*Quarterly Review of Biology*

About the Author

Michael Angilletta earned a B.S. in Biology from the College of New Jersey and a Ph.D. from the University of Pennsylvania. Since 2000, he has been a professor at Indiana State University, where he has conducted research in ecology and evolutionary biology. This research has resulted in more than 35 scientific papers which have appeared in journals such as *Ecology*, *Evolution*, and *The American Naturalist*.

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