



Environmental Physiology of Animals

By Pat Willmer, Graham Stone, Ian Johnston

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The new and updated edition of this accessible text provides a comprehensive overview of the comparative physiology of animals within an environmental context.

- Includes two brand new chapters on Nerves and Muscles and the Endocrine System.
- Discusses both comparative systems physiology and environmental physiology.
- Analyses and integrates problems and adaptations for each kind of environment: marine, seashore and estuary, freshwater, terrestrial and parasitic.
- Examines mechanisms and responses beyond physiology.
- Applies an evolutionary perspective to the analysis of environmental adaptation.
- Provides modern molecular biology insights into the mechanistic basis of adaptation, and takes the level of analysis beyond the cell to the membrane, enzyme and gene.
- Incorporates more varied material from a wide range of animal types, with less of a focus purely on terrestrial reptiles, birds and mammals and rather more about the spectacularly successful strategies of invertebrates.

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Editorial Review

Review

"...this second edition confirms its status as the first place I would go for guidance in unfamiliar physiological territory. Its level is perfect for undergraduates...this is a terrific text, and one that I recommend unreservedly." *Andrew Clarke, British Antarctic Survey, Trends in Ecology and Evolution, August 2004*

From the Back Cover

This new and updated edition, with two entirely new chapters, provides a comprehensive coverage of the comparative physiology of animals, in a strongly environmental context.

It provides full analysis of the basic principles of physiological adaptations, in both vertebrates and invertebrates. It now also includes new chapters on the control systems (nervous and sensory systems, muscles, and hormones) and how they allow integration with the environment, suitable for introductory courses on excitable tissues

But it is unique in also providing detailed and integrated reviews of how animals sense, react to and cope with particular environments - the marine and freshwater worlds, the particularly challenging seashore and estuarine zones, the different kinds of terrestrial habitat, and the parasitic environment. In this way, physiology is for the first time properly integrated with ecological principles and with behavioural responses used by animals in coping with environmental challenges.

The book provides a stand-alone core text for undergraduate courses in comparative physiology, animal physiology, or environmental physiology, but also provides key material for integrating across modules in any environmental biology degree.

About the Author

Pat Willmer began her research career in neurobiology at Cambridge, progressively switching to broader interests in invertebrate physiology and the interactions of physiology, ecology, and behavior. Her current interests at St Andrews mainly focus on insect environmental physiology, and effects on insect-plant interactions.

Graham Stone began his research career in entomology at Oxford, progressively switching to broader aspects of the biology of insect-plant interactions. His current interests at Edinburgh mainly focus on pollination ecology (particularly of Acacia communities in Africa) and the biology of oak gallwasps.

Ian A. Johnston began his research career at Hull and Bristol. His research group at St Andrews is currently utilizing genomic, molecular, physiological, structural, and whole organism approaches to investigate muscle development and growth in teleost fish, with particular reference to temperature adaptation and the evolution of Antarctic and Arctic species.

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