

## ECOPHYSIOLOGY OF DESERT REPTILES

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#### CONTENTS

Introduction	121
The Biological Concept of Adaptation	122
Adaptation of Desert Reptiles	123
The Maintenance of Physiological Homeostasis	
in the Desert Environment	
The Problem of Stress	1.24
An Operational Definition of Stress	125
Behavioral Thermoregulation	125
Water and Electrolyte Balance	129
Evaporative Water Loss	134
Conclusions	135
Literature Cited	137

Abstract: Reptiles have radiated widely in the deserts of the world and have long been regarded as the acme of adaptation to aridity among the vertebrates, but recent ecophysiological studies question this conventional wisdom. It has proven difficult, if not impossible, to identify discrete behavioral and physiological adaptations in desert reptiles that are unique to these animals and not also found in species inhabiting temperate and mesic environments. It is suggested that this apparent paradox may be resolved by analyzing the extent to which desert reptiles maintain physiological homeostasis (homeostasis) under natural conditions in the field, and by documenting instances of exposure to stress in field populations.

#### INTRODUCTION

A sherpetologists, we are naturally interested in every aspect of the life of reptiles, but physiologists primarily study them for one of two major reasons: (1) although now widely separated from the birds and mam-

mals, reptiles are nonetheless their progenitors, and the close study of living reptiles may provide heuristic insights into the factors responsible for the evolution of the more complex systems of control seen in these two classes; and (2) the spectacular radiation of reptiles in the deserts of the world, which implies the existence of novel or other mechanisms adapting them to the exigencies of life in regions normally regarded as inhospitable.

This second common assumption underlying much of the research on reptilian ecophysiology over the past two decades-that desert reptiles are uniquely adapted to the harsh environments in which they occur—has only recently been questioned in the light of detailed studies of both desert and non-desert species, comparing their physiological performance under both laboratory and field conditions (see Bradshaw 1981, 1986a, 1988). Gould and Lewontin (1979) drew attention to what they termed the Panglossian excesses of the "adaptationist programme" and the widespread tendency of biologists to interpret any measurable differences between species as adaptations per se, thereby ignoring possible non-genetic changes resulting from acclimation or acclimatization. This possibility is always entertained, but usually dismissed summarily, and most statistically significant differences that confirm one's initial hypothesis are effectively considered as heritable modifications of the phenotypes, rendered through the agency of natural selection.

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# **Ecophysiology Of Desert Reptiles**

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## **Table of Contents Ecophysiology Of Desert Reptiles**

- 1. Understanding the eBook Ecophysiology Of Desert Reptiles
  - The Rise of Digital Reading Ecophysiology Of Desert Reptiles
  - Advantages of eBooks Over Traditional Books
- 2. Identifying Ecophysiology Of Desert Reptiles
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Ecophysiology Of Desert Reptiles
  - User-Friendly Interface
- 4. Exploring eBook Recommendations from Ecophysiology Of Desert Reptiles
  - Personalized Recommendations
  - Ecophysiology Of Desert Reptiles User Reviews and Ratings
  - Ecophysiology Of Desert Reptiles and Bestseller Lists
- 5. Accessing Ecophysiology Of Desert Reptiles Free and Paid eBooks

- Ecophysiology Of Desert Reptiles Public Domain eBooks
- Ecophysiology Of Desert Reptiles eBook Subscription Services
- Ecophysiology Of Desert Reptiles Budget-Friendly Options
- 6. Navigating Ecophysiology Of Desert Reptiles eBook Formats
  - o ePub, PDF, MOBI, and More
  - Ecophysiology Of Desert Reptiles Compatibility with Devices
  - Ecophysiology Of Desert Reptiles Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Ecophysiology Of Desert Reptiles
  - Highlighting and Note-Taking Ecophysiology Of Desert Reptiles
  - Interactive Elements Ecophysiology Of Desert Reptiles
- 8. Staying Engaged with Ecophysiology Of Desert Reptiles
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Ecophysiology Of Desert Reptiles
- 9. Balancing eBooks and Physical Books Ecophysiology Of Desert Reptiles
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Ecophysiology Of Desert Reptiles
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Ecophysiology Of Desert Reptiles
  - Setting Reading Goals Ecophysiology Of Desert Reptiles
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Ecophysiology Of Desert Reptiles
  - Fact-Checking eBook Content of Ecophysiology Of Desert Reptiles
  - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development

- Exploring Educational eBooks
- 14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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