# ISLANDS

Diversity and Conservation

Edited by Harvey B. Lillywhite and Marcio Martins

# Islands and Snakes

Diversity and Conservation

Harvey B. Lillywhite and Marcio Martins

# Description

In this follow-up to *Islands and Snakes*, this book contains 15 chapters describing diversity and conservation of snakes on islands, with foci on selected island systems not previously summarized. Attendant topics include biogeography, plasticity and evolutionary responses to insular conditions, invasive species, importance and collapse of trophic systems, threats to insular snake populations, and strategies of conservation to save them. Chapters include descriptions of snake faunas on larger islands such as Borneo and New Guinea; reproductive biology of insular snakes; phenotypic evolution; physiology and growth patterns related to diet and environment; patterns of endemism; taxonomy of snake radiations; and history of invasions by snakes on islands. The final chapter presents a discussion of prospects and overview of conservation of snakes on islands.

Chapters are contributed by international authorities on respective island-and-snake systems. The latter include some islands or archipelagos that are young, or of high importance, or support snake populations that were previously not well known. The content includes colourful photographs, informative illustrations, and in some cases synthesis of new data relevant to the importance of islands for understanding the ecological underpinnings and genesis of biodiversity. Each chapter is appropriately referenced with citations to scientific literature, and where useful, footnotes, tables and graphic information supporting the narrative of the respective subject matter. The overall presentation is intended to provide readers with an enhanced appreciation for islands and the spectacular snakes that might live there.

# Author Information

**Dr. Harvey B. Lillywhite** is Emeritus Professor of Biology at the University of Florida. He is past Director of the Seahorse Key Marine Laboratory and has held international visiting positions at six universities, NASA-Ames Research Laboratory, and Scripps Institution of Oceanography. He has published 4 books and numerous articles related to biology of snakes, with emphasis on understanding adaptation of structure and function relating to ecology, behavior and evolution. Dr. Lillywhite has conducted field research in Costa Rica, Australia, India, Fiji, Philippines, Thailand, Taiwan, and other parts of Asia. He was listed in the top 2% of scientists worldwide based on standardized citation indicators.

**Dr. Marcio Martins** is a Full Professor of Ecology at the University of São Paulo, Brazil. He has published 4 books and numerous scientific articles on the natural history, ecology, and conservation of frogs and snakes, including several studies on island snakes from Brazil and Mexico. He has been participating actively in the production of red lists of amphibians and reptiles (both in Brazil and for the IUCN). He was the president of the Brazilian Society of Herpetology (BSH) from 2011 to 2019 and is now a member of the IUCN Viper Specialist Group.

### Contributors:

Selma Maria Almeida-Santos Ligia Grazziely dos Santos Amorim Gustavo Arnaud Dragan Arsovski Fausto E. Barbo Xavier Bonnet Henrique B. Braz François Brischoux Gordon M. Burghardt S. R. Chandramouli Diego F. Cisneros-Heredia Keara Clancy Natalie Claunch Indraneil Das Pedro Galán James C. Gillingham Ana Golubović

Felipe Gobbi Grazziotin Madison Harman Daniel Haro Arik Hartmann Masami Hasegawa Kodiak Hengstebeck Robert Jadin Michael J. Jowers Diego Juárez-Sánchez Karina Kasperoviczus Mark A. Krause Simon Maddock Otavio A. V. Marques Rebecca McKee Akira Mori John C. Murphy Mark O'Shea John S. Placyk, Jr. Carolina Reyes-Puig Christina Romagosa Mark Sandfoss Ricardo J. Sawaya Amber Sutton Ljiljana Tomović Mariaguadalupe Vilchez John Weber

### Table of Contents

Preface

Acknowledgments

List of Contributors

1. Snakes of a Continental Island: History and Patterns of Discovery of the Snake Fauna of Borneo to the Start of the Anthropocene - Indraneil Das

2. Serpents of Paradise: Biogeography of the Snake Fauna on New Guinean Islands - Mark O'Shea and Simon Maddock

3. Reproductive Strategies of the Golden Lancehead, Bothrops Insularis, From Queimada Grande Island: Constraints and Challenges - Karina N. Kasperoviczus, Henrique B. Braz, Ligia G. S. Amorim, and Selma M. Almeida-Santos

4. Lanceheads in Land-Bridge Islands of Brazil: Repeated and Parallel Evolution of Dwarf Pitvipers - Ricardo J. Sawaya, Fausto E. Barbo, Felipe G. Grazziotin, Otavio A. V. Marques, and Marcio Martins

5. Two Islands, Two Origins: The Snakes of Trinidad and Tobago - John C. Murphy, John C. Weber, Michael J. Jowers, and Robert C. Jadin

6. Giant Snakes and Tiny Seabirds on a Small Japanese Island - Masami Hasegawa and Akira Mori

7. Distribution Patterns of Snakes and Conservation Importance of Islands in the Andaman and Nicobar Archipelago, Bay of Bengal, India - S. R. Chandramouli

8. Diversity, Endemism, and Biogeography of Island Snakes of the Gulf of California, Mexico - Gustavo Arnaud, Ricardo J. Sawaya, and Marcio Martins

9. Natural History and Conservation of the Galapagos Snake Radiation - Diego F. Cisneros-Heredia and Carolina Reyes-Puig

10. Paradise Lost: Collapse of the Unique Cottonmouth Population on Seahorse Key - Mark

### Robert Sandfoss

11. Marooned Snakes: Ecology of Freshwater Natrix Maura Isolated on the Atlantic Islands of Galicia (Spain) - Pedro Galán and François Brischoux

12. Golem Grad: From a Ghost Island to a Snake Sanctuary - Xavier Bonnet, Dragon Arsovski, Ana Golubović, and Ljiljana Tomović

 Welcome to Paradise: Snake Invasions on Islands - Natalie M. Claunch, Keara L. Clancy, Madison E. A. Harman, Kodiak C. Hengstebeck, Diego Juárez-Sánchez, Daniel Haro, Arik Hartmann, Mariaguadalupe Vilchez, Rebecca K. McKee, Amber Sutton, and Christina M. Romagosa

14. Gartersnakes of the Beaver Archipelago: A Story of Plasticity and Adaptation - Gordon M. Burghardt, Mark A. Krause, John S. Placyk Jr., and James C. Gillingham

15. Prospects and Overview for Conservation of Snakes on Islands - Harvey B. Lillywhite and Marcio Martins