HORMONES AND REPRODUCTION OF VERTEBRATES, VOLUME 4—BIRDS

Norris, D.O. & Lopez, K.H. (Eds.) 2011. London, UK, Burlington, USA, San Diego, USA: Academic Press, Elsevier. 286 pp., 55 black and white illustrations, 10 colour plates. Hardcover: ISBN 978-0-12-374929-1. US$119.95.

This book provides an extensive review of our current knowledge of the endocrinology of reproduction in birds. The book is divided into nine complementary chapters that focus on the neuroendocrine functioning of reproduction in birds and, thus, detail the complex mechanisms and pathways that govern several phases of the reproductive cycles. In addition, several chapters emphasize the role that these endocrine mechanisms play in regulating life-history trade-offs in birds. These chapters therefore explain the relevance of studying these endocrine processes to investigate evolutionary and ecological processes in birds.

The following topics are detailed in this book. First, Ubuka and Bentley review the complex neuroendocrine mechanisms that govern reproduction in birds (i.e. the hypothalamic-pituitary axis). They especially focus on the neuroendocrine regulation of the initiation of breeding and thus provide a physiological basis to better understand seasonal reproduction of bird species. Next, Deviche, Hurley, Fokidis and Johnson review the structure, functions and regulation of testis and ovaries, including current knowledge of the complex structures of testes and ovaries and the hormone-related regulation of their reproductive functions. Interestingly, Deviche *et al.* also detail the functional differences between bird species, placing development of the hormonal regulation of reproduction in a life-history and ecological context. In the fourth chapter, Engelhardt and Groothuis detail how and why several hormones can be found in avian eggs. They pay specific attention to the consequences of contrasting hormone levels in eggs on the development of the chick and the adult phenotype later in life. Finally, they emphasize that the measurement of hormone levels in eggs can be relevant when studying evolutionary processes in birds. In chapter 5, Breuner reviews the influence of stress on reproduction, paying specific attention to the functional role of the main stress hormone in reproduction (i.e. corticosterone in birds.) She details the morphological, physiological and behavioral effects of corticosterone and explains how it can be related to life-history strategies and fitness in the wild. Following this, Riters and Alger review the functioning of the complex neuroendocrine pathways that govern courtship and mating behaviors and synchronize these events with appropriate environmental cues. They especially emphasize the neuroendocrine differences between sexes in the regulation of these behaviors. In an excellent chapter, Carol and Vleck review the hormonal regulation of parental behaviors. Their chapter supports the idea that prolactin, and to a lesser extent corticosterone, are the main hormones regulating parental effort in birds. Ramenofsky emphasizes how endocrinology plays a crucial role in the organization of life-history cycles of birds. She pays specific attention to the endocrine control of the timing of migration and breeding. Finally, Ottinger and collaborators detail how anthropogenic chemicals can disrupt the avian endocrine system and thus affect bird populations through their impact on the physiology of reproduction.

I believe that this book will be very useful to master's and doctoral students as well as early-career scientists who wish to become familiar with the complex topic of comparative endocrinology of reproduction in birds. Importantly, this book explains reproductive endocrinology not only in a classical physiological way, but also in a more ecological and evolutionary way. Thus, it reviews the functioning of the neuroendocrine axes by detailing complex mechanisms that govern the regulation of reproduction (see chapter 1 for an example) but it also emphasizes how endocrine mechanisms can link environmental conditions to reproductive decisions and life-history trade-offs (see chapter 5 for an example). Although the understanding of this book requires some basic knowledge of endocrinology and physiology in vertebrates and is therefore probably too complex for undergraduate students, I believe that it is an excellent tool for master's and doctoral students who are planning to incorporate functional avian endocrinology and evolutionary avian endocrinology into their work. Importantly, I also believe that this book is a very accurate and up-to-date review, and I am confident that it will be very useful to scientists and professors interested in reproductive endocrinology. It is also important to note that the editors, Norris and Lopez, put together several excellent books detailing the hormonal control of reproduction in other vertebrates (volumes 1 to 5 of the series cover fish, mammals, amphibians and reptiles).

This book is dedicated to providing an extensive and accurate review of the endocrine control of reproduction in birds. Although it will be useful to seabird eco-physiologists interested in this topic, it is worth noting that the book does not have a strong focus on seabirds. Indeed, the neuroendocrine control of reproduction is classically studied in laboratory birds and, to a lesser extent, in wild passerine species, but rarely in seabirds. This results from practical reasons, such as the difficulty of holding seabirds in captivity. However, hormonal mechanisms have been increasingly used in the field during the last decades to investigate ecological processes in seabirds. In that respect, several chapters will be useful to seabird ecologists and eco-physiologists, showing why and how hormonal levels can provide useful information on reproduction of birds, including seabirds. Finally, this book definitely focuses more on basic research than applied research and, therefore, I believe that this book will be of limited interest to managers.

I think that David Norris and Kristin Lopez have managed to successfully review our current knowledge of the endocrinology of reproduction in birds. The contributors to this book are all internationally known for their expertise in the field of reproductive endocrinology, and I believe that this book will be a valued reference for avian eco-physiologists in the coming decade.

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