

Preface to Volume 6

AMPHIBIANS have some attributes that are shared with only a limited subset of the other Classes of vertebrates, or are unique. Examples are metamorphosis, the water drive, and the ability to change colour. Some of these functions rely on hormones that are equivalent to those of other vertebrates but put to different, or additional, uses in amphibians.

By contrast, some hormones function similarly in amphibians as in other vertebrates. For example, in all vertebrates, the pituitary co-ordinates the functioning of the other endocrine glands, thyroxine is involved in metabolism and the sex steroids control reproduction.

Clearly, assessment of both the similarities and differences among the different groups of vertebrates is essential for an understanding of the evolution of different life styles and adaptation to varying environments. For such comparisons to be made it is important to bring together and summarize the endocrine systems of each group. This volume contributes toward that end for amphibians. Although not broadly comparative itself, it reviews in a comprehensive way the functioning of the amphibian endocrine systems, outlines the variation among taxa within the group, and provides a framework for comparison with other Classes.

It was not the intent merely to produce a volume of independent monographic papers. Rather, the goal was to provide an integrated, comprehensive treatment of the subject that would serve as a starting point for future investigations.

The first chapter provides the morphological background for the rest of the book by describing the anatomy of the amphibian endocrine system. Following chapters treat the various endocrine systems in terms of their function and development as related to particular aspects of amphibian life. Three chapters deal with different aspects of reproduction, including reproductive cycles (Chapter 2), breeding behaviour (Chapter 3), and the development of secondary sexual characters (Chapter 5). Two chapters have a strong developmental emphasis, with Chapter 4 treating the role of hormones in metamorphosis and Chapter 7 dealing with hormonal regulation of growth. Three chapters deal with hormonal regulation of various day-to-day physiological processes such as metabolism (Chapter 6), osmoregulation (Chapter 8) and colour change (Chapter 9). The book closes with an account of the role of hormones in the immune system of amphibians (Chapter 10).

Inevitably, overlap occurs when dealing with separate aspects such as behaviour, development and anatomy, that relate to the same function. In the present volume, the design was to avoid undue overlap but not to eliminate it altogether. It was felt that although the various chapters were co-ordinated editorially, each should be able to be read as an entity without excessive referral to other parts of the book. This is particularly true of reproduction, for which there are separate chapters on different aspects of the topic. Some of the hormones involved in reproduction also have non-reproductive functions and appear in other appropriate chapters as well. Consequently, some of the same material is treated in more than one chapter, and some of the same references are cited. Where this occurs, the most extensive discussion is reserved for one chapter, with similar material elsewhere abstracted by the editor, with cross-references to related chapters.

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Harold Heatwole