PACIFIC MARLINS: ANATOMY AND PHYSIOLOGY. By Peter S. Davie. 1990. Massey University, Palmerston North, New Zealand. 88 p., NZ$42 (hardcover).—Anatomical and physiological information on Pacific marlins has been collected here into a single volume to complement two published symposia on billfishes (Shomura and Williams, 1974, 1975; Stroud, 1989, 1990), both of which focus on fisheries management. Most of the book is a literature review, but some of the anatomy is original, unpublished work.

The book is very readable and is illustrated with original black-and-white drawings and photographs. It is reasonably free of mechanical mistakes: I found only seven printing errors and two poorly constructed sentences. Because little anatomical and physiological information about billfishes exists, the author easily fulfills his stated purpose. The book suffers from not having a defined audience, being too narrow in scope, and not having been peer reviewed. At times the text is written for the layperson, and at other times it is written for the specialist. Comparisons with published information on other billfishes or their scombroid relatives are inconsistent and infrequent, especially in the anatomical chapters. Davie never discusses evolutionary trends and rarely discusses intraspecific variation.

The book is divided into two sections: anatomy with seven chapters and physiology with five chapters. Chapter 1 is a well-illustrated, general description of the skeleton. Davie uses a combination of classical and other names for the bones without citing the source of his terminology. For example, teleost fish do not have an alisphenoid, ethmoid, or a dentary but instead have an orbitosphenoid, mesethmoid, and a dentosplenial (Jollie, 1986). The palate and sagittal sections of the neurocranium are not illustrated; and the coronomeckelian (Jollie, 1986), vomer, and prenasal bones (Schultz, 1987) are not mentioned. There is no discussion of bone histology or ontogeny and little discussion of important ligaments.

Three chapters are filled with original information. The origin, insertion, and innervation for each skeletal muscle are given in Chapter 2; however, the results from my own dissections of the Pacific blue marlin and black marlin differ somewhat from Davie’s descriptions. Most of these differences may be due to individual variation, but a few others are more fundamental. For example, I disagree that Pacific marlins have an adductor hyomandibulae, and Davie has reversed the origin and insertion of the retractor dorsalis. The axial musculature receives a superficial treatment, and there are too few (only three) illustrations in the chapter. Muscle architecture is hardly mentioned.

Chapter 3, on the anatomy of the cardiovascular and respiratory systems, is very complete and well illustrated, reflecting the author’s special discipline. However, it serves as an example of the author’s indecision in choosing his audience. On the one hand, arteries, veins, and portal system are defined as though written for an elementary textbook, whereas on the other hand, descriptions of heart histology and peripheral circulation are especially detailed.

Chapters 4, 5, and 7 are primarily literature reviews of the alimentary, urogenital, and integumentary systems, respectively. Figures 23-25 are meant to illustrate the viscera of the Pacific blue marlin, yet the height of the dorsal fin and the 12 precaudal vertebrae are diagnostic features of the striped marlin, according to Davie’s description on page 80. The author uses the amniote terms, urethra and deferent
duct (vas deferens), whereas teleosts have non-homologous structures called urinary and sperm ducts (Romer and Parsons, 1986). Illustrations would have helped the reader differentiate the various reproductive stages. Chapter 6 describes the gross features of the nervous system and presents an excellent figure for identifying the foramina of the skull.

Chapter 7 contains an original description of the integument; however, it is filled with confusing terminology and misidentifications that could have been avoided if Davie had cited and followed a general reference on skin (e.g., Krejsa, 1979). He refers to epidermal cells when he means epithelial cells, to collagen when he apparently means collagen fibrils, and to a connective tissue layer when he means dermis. He misidentifies stratum compactum as hypodermis in figure 33 and describes structures in the spongy dermis layer when it is unclear to the reader where the layer is located.

The section on physiology is a brief review of the literature for a scientifically sophisticated audience. In 20 pages, Davie discusses blood (Chapter 9), vision and eye and brain heaters (Chapter 10), cardiovascular physiology (Chapter 11), and swimming (Chapter 12). I found these chapters very informative and welcomed Davie’s speculations that he scatters throughout the text. Illustrations of muscle mechanics and flow over the body of a marlin would greatly improve the chapter on swimming.

Anyone interested in the biology of scombroid fishes should read this slim volume. It is not a definitive work, as the book’s title suggests, but at present there is no substitute.

Literature Cited


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