

tion, including some German spellings in the figures. Another small complaint that I have (perhaps characteristic of this publisher) is that nowhere in the book does one find mention of the author's academic (or other) affiliations.

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Vertebrate Functional Morphology: Horizon of Research in the 21st Century. H. M. Dutta and J. S. Dutta Munshi (eds). Oxford and IBH Publishing Co Pvt Ltd, 66 Janpath, New Delhi 110 001. 2001. 487 pp. Price not mentioned.

This book, a sequel to *Fish Morphology: Horizon of New Research* by the same editors, is claimed to be a novel contribution to functional morphology of selected systems from representative vertebrate classes. It includes an introduction and 16 chapters. The first five are concerned with the cartilaginous skeleton, head morphology, gustatory and feeding organs, respiratory system of gill- and air-breathing fishes. A single chapter narrates the functional morphology of feeding apparatus of squamates. Then a series of three chapters describes the taste organs, ultrastructure of lung, and reproductive system of selected amphibians. The next two chapters deal with feeding apparatus of woodpecker and the like. Subsequently, two chapters are assigned to comparative morphology of kidney and vessels of different vertebrate groups. The last but two chapters go on with the digestive and reproductive systems of selected mammals. The last chapter, the most interesting one, explains the 3D-reconstruction as an advanced method in morphological research.

Morphology describes the form, including features such as topography, size, shape, structure and quality, and other secondary features. Functional morphology is concerned with mechanical and

spatial arrangements of parts and structural features, and other functions within the architecture of an organism. As a hybridized subject between anatomy and physiology, functional morphology was taught in zoology classes at the undergraduate and postgraduate levels in universities and colleges about 10–20 years ago. However, with a view to assess the new contribution of the book to this 'old but established subject', the reviewer found that of 1193 references cited in the book, 306 were published after 1990s. Hence, one may look for new information. But the chapters by H. M. Dutta, M. Jakubowski and K. Zuwala, O. Gurina and N. F. Zhukova have less than 10% references, which were published after 1990. Remarkably, of 89 citations referred by J. Streicher, 57 publications are dated after 1990. Hence, 3D-reconstruction as a method is perhaps the most active area of morphological research.

Functional morphologists have employed a wide variety of instruments to derive more precise information on the form and function of the chosen organ, system and organism. This book mentions about the use of instruments, ranging from light microscopy to electron microscopy and confocal laser scanning microscopy, cinematography to cine-radiography to electromyography and a wide variety of computer-aided virtual sectioning technology, stereolithography and so on. Usage of these modern equipment has emboldened Streicher to claim that within the next decade, technical progress will allow the production of 3D-reconstruction of almost any type of specimen from macroscopic to molecular level.

Remarkably, the review by G. M. Wright and F. W. Keeley summarizes the morphological, biochemical and molecular biological analyses of the family of unusual non collagen-based cartilages in the skeleton of lamprey. Similarities between the agnathan, cartilage matrix proteins and elastin-based cartilage in higher vertebrates led them to speculate that the evolutionary lineage of elastin may be traced through cartilage rather than visicular tissues. Zoologically, it is interesting to note that the accessory respiratory organs of air-breathing fishes and amphibians can easily cope with oxygen demand, but are unable to function efficiently in CO₂ elimination. In the adult amphibians too, lungs are the main place of oxygen uptake, while the skin is

the site of CO₂ excretion. The length of pulmonary capillaries increases from 3.5 m/g body weight of *Triturus cristatus carnifex* with smooth lungs and low level metabolism to 34.0 m/g of *Hyla arborea* with high level cellular metabolism. Smaller cells of *Anura* display higher level of metabolism than the larger ones of *Urodela*.

Notably, the choice of authors for this book has been global; among the 19, five are from USA, three from Poland, two each from Austria and Canada, and one each from Belgium, England, India, Mexico, The Netherlands, Russia and Ukraine. Apparently, reasonably good research work on functional morphology is undertaken all over the world. Admirably, the Polish and Russian authors have used flawless language and have had the required access to relevant English literature.

It is not clear why the editors have not chosen to accomplish a comprehensive account on the functional morphology of an organ system of all the vertebrate classes, or all organ systems of a higher vertebrate class. It is also not clear why chapters on 'Mammalian Reproduction' and 'Animal Vessels' were included and authored by A. Hossain and H. M. Dutta (one of the editors), and O. Gurina respectively; they have not published original contribution(s) related to the title chosen or given to them. As such, they cannot claim themselves as internationally known experts. Consequently, these articles, especially the one on 'Mammalian Reproduction' read like an essay written by a college student. The editors have also failed to bring the expected standard in 'References'. For instance, there are more than a dozen mistakes (e.g. america) in the 'References' listed by H. Ditrich; spelling mistakes are also not uncommon (e.g. Chiroptera instead of Chiroptera, p. 391). The authors and editors have also failed to make necessary corrections in the proof. For instance, Figures 2 and 5 in the chapter by Ditrich are a verbatim repetition. Annoyingly, the legends for these figures are different and not compatible.

Yet, this book may be regarded as an oasis in the desert.

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