

Preface

Invertebrate Embryology and Reproduction is an essentially descriptive book. Although this branch has long been a core subject recognized as a necessary and valuable part of Zoology and Biology courses, it was not considered as a definite course in Egypt until the 1970s.

To give a brief account of my academic background, I ought to start by saying that I was an extremely curious student, fascinated by embryology, with an ambition to pursue an academic research career. I graduated from the Faculty of Science, Alexandria University in June 1955; at that time, unfortunately there were no available posts, and I was not able to join the faculty to fulfil my dream. However, I joined the Oceanography department to pursue my postgraduate studies. The Dean of the Faculty of Science at the time, the late Professor Doctor Abdel Fattah Mohammad, who happened to be teaching a course for this programme, became familiar with my work, and was quick to recognize my devotion to academe. Consequently, he offered me a post in the Zoology department; thus I became a university staff member in January 1956, and continue to be one. As a demonstrator in the practical laboratories, I was exposed to a variety of specialties in the science of zoology. However, I was always interested in embryology, and intended to pursue research in experimental embryology, but due to the lack of financial resources, my request to equip a suitable laboratory was rejected.

I was selected by the head of the Zoology department then, the late Prof. Dr Mahmoud Ramadan, who was the Professor of Invertebrates, as the demonstrator for the invertebrate laboratories. Consequently, my research was primarily concerned with invertebrates. My MSc and PhD theses were on Crustacea, and the PhD was on spermatophore, under the supervision of Prof. Ramadan. I feel privileged to have been his postgraduate student, and to have had the opportunity to work closely with him. His indelible influence on me, and on many others, is eternal. On the other hand, Prof. Dr Samy Riad, as a joint supervisor of my PhD, was the one who planned the course of the work, and basically taught me the principles of research, and the importance of integrity in carrying it out. I was incessantly guided and motivated by his discussions and decisive criticism. I was also well supported by the capable senior colleagues at this stage, Prof. Anga Ramadan and Prof. Milad Ishaa.

Eventually, I was considered the successor of Prof. Ramadan in Invertebrates. To follow on from his work, I created the 'Invertebrate school' in the Zoology department. Later, as a professor, I could confidently describe myself as an untraditional academic, working hand in hand with my students. I persistently examined the specimens myself, and aided in the actual writing of the theses, and in the interpretations and discussions.

By the time I had finished my PhD and started working as a lecturer on Invertebrates in the Zoology department at the Faculty of Science in Alexandria University, Oceanography had just started to be included as an undergraduate course. I was recommended by the head of the Zoology department at the time, the late Prof. Dr Shukralla Nakhla Sidra, to the head of the Oceanography department, Prof. Dr Saad El Wakil, to teach Invertebrate Embryology for the first time. I was the first, and the only one, to prepare and teach this course starting in 1970. I taught it to the general degree and special degree students, as well as for the pre-master's students. I also taught Experimental Embryology to the master's students. The great challenge then was that there were virtually no resources. I had to manage by using information out of the development and reproduction chapters from the available invertebrate books. For years, I had to ask any colleague or student travelling abroad to look for books specializing in invertebrate embryology.

It was only due to the genuine willingness of my departmental colleagues to help that I was supplied with the main available references in the field of invertebrate embryology over the years. The late Prof. Dr Mahmoud El-Zayat, Professor of Zoology, while in the United States ordered a book on invertebrate embryology edited by Kumé and Dan, translated from Japanese by J.C. Dan. After an unusually long wait, he had to place another order. Fortunately, I received both copies. Likewise, I can only be grateful to all other colleagues who travelled abroad over the years and went out of their way to provide me with the most-needed books: Dr Essam Abdulla, lecturer of Zoology, brought me *Experimental Embryology of Marine and Fresh Water Invertebrates*, by G. Reverberi, 1971, from the United States. Dr Desouky Mekawy, Professor of Zoology, brought me the valuable German book by O. Pflugfeder, 1970: *Lehrbuch der Entwicklungsgeschichte und Entwicklungsphysiologie der Tiere*. Dr Safaa Zaki, Lecturer of Zoology, brought

me an unpublished MSc thesis, from the University of Maryland, United States, titled *A Histological Study of the Development of the Ovary and Accessory Reproductive Organs of the Blue Crab, Callinectes sapidus (Rabhdum)*, by L.E. Cronim, 1942. Dr Mohga El Abbady managed to send me different articles from the Congress Library in the United States, including an article about *Helix Pomatia* (E. Lind, 1973). Locally, people were equally supportive. Dr Mahmoud Ibrahim, Assistant Prof. of Molecular Biology, was always keen to provide me with all the related articles he found while searching on the Internet, in addition to his continual assistance with any article related to molecular biology.

The library in the Faculty of Science in Alexandria University has always offered me a fantastic service in terms of facilitating book borrowing. The late Prof. Dr Ibrahim El-Kholy, who was the Vice Dean of the Faculty of Science and Chair of the library, never rejected a purchase request that I submitted as a lecturer in Zoology. I therefore managed to get to the library a few purchases, including the series of *Reproduction of Marine Invertebrates* (volumes I–V). However, this series was not complete. I searched for it myself in UK bookshops during a visit there and realized that this series was not in circulation any more. I wrote to one of the editors, Giese, asking for the rest of the series, and received a reply from Pearse, the co-editor, who sent me volume VI, *Echinodermata and Lophophorates*, as well as all the related articles.

All those difficulties encouraged me into the idea of writing a comprehensive book about invertebrates. Having gone deeper in embryology through teaching, I found that books on the subject are quite rare in the market. For years, the update of the invertebrate embryology was confined to limited information from references dealing with general invertebrate reproduction. It did not cover all the phyla, and

the books never included animals from the Mediterranean region. This does not fulfil the need for a comprehensive and exclusive update of the field. Even the recent publications, *Embryology, Constructing the Organism*, by Gilbert and Raunio, 1997, and *Developmental Biology* by Gilbert, 2000, are general and neither is exclusive to invertebrate embryology. In addition, the *Atlas of Comparative Invertebrate Embryology* by Dr Martin E.L. Scriba contains figures and not text. Its aim is to show clear figures for the invertebrate embryology, but not to describe and discuss the developmental stages for further research and teaching purposes. I therefore decided that it would be a pleasure and honour to write a comprehensive book as an Egyptian scholar, and to invest all the great effort spent preparing that course over the years.

This book therefore gathers all the information dealing with descriptive invertebrate embryology and updates this information in a single source, as a basic reference for teaching courses and research. The difficulty of obtaining teachable or research data in the field of descriptive embryology, not only in the Egyptian libraries but everywhere, demonstrated the need for a new work that collates all the available data concerning that field. The collection herein is sought from specialized references, in addition to general textbooks in reproduction, carried out by a professional expert in that field. It includes the description of embryology of newly studied species in most of the phyla, together with their systematic positions, and the results obtained from different researches using advanced techniques and different procedures, especially electron microscopical ones. It is specific to descriptive invertebrate embryology, including numerous invertebrate species. I hope that this effort will provide a coherent integrated account of the field that I attempted to cover, to the satisfaction of the reader.