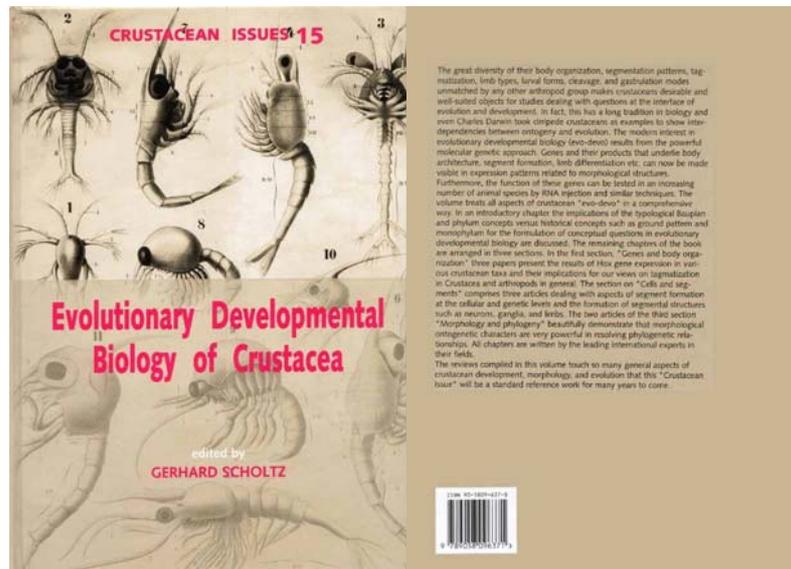


Scholtz, G. Ed. 2003. *Evolutionary developmental biology of Crustacea*. – Lisse, A.A. Balkema Publishers

Book review by C.H.J.M. Fransen



Crustacean Issues started out in 1983 with Frederick Schram as general editor, aiming to publish books on specific subjects in the field of crustacean research every few years. An array of topics has been treated in the 14 volumes published so far. This 15th volume treats crustacean evo-devo ranging from theoretical aspects in the introduction over genes and body organisation in the first section to cells and segments in the second and morphology and phylogeny in the third section. This comprehensive treatment of issues on the interface of evolution and development results in an integrated view of the subject presented by top authors in their field. In a clearly structured introductory chapter, Scholtz discusses the implications of the typological *Bauplan* and *phylum* concepts versus historical concepts such as *ground pattern* and *monophylum* for the formulation of conceptual questions, thus setting the stage for the following contributions.

The first section ‘Genes and body organization’ includes three contributions that discuss the results of *Hox* gene expression in various crustacean taxa and their implications for our views on tagmatization. The first contribution (‘Genes, segments, and tagmata in cirripedes’ by Deutsch, Mouchel-Vielh, Quénec & Gibert) addresses the problem of whether cirripedes possess an abdomen and indeed provide evidence for a vestigial larval abdomen. In the second contribution, Abzhanov & Kaufman (‘*Hox* genes and tagmatization of the higher Crustacea (Malacostraca)’ compare the expression of the *Hox* gene complex in a crayfish and a woodlouse. In a convincing way they show that the homologous *Hox* genes of the trunk have evolved to acquire different developmental functions in various crustacean groups. In the third contribution, Schram & Koenemann (‘Developmental genetics and arthropod evolution: on body regions of Crustacea’) review the information on *Hox* gene expression in various crustaceans in relation to tagmatization, and subsequently discuss the possibility that crustaceans are not monophyletic. Many coloured schematic drawings of body segmentation in relation to *Hox* gene expression in various groups, contribute much to the clarity of the chapter.

In the second section ‘Cells and segments’, another three contributions are grouped. Dohle, Gerberding, Hejnal & Scholtz (‘Cell lineage, segment differentiation, and gene expression in crustaceans’) clearly demonstrate malacostracan monophyly by describing the unique cell division pattern during germ band formation and segmentation of various malacostracans when compared to other arthropods. In the second contribution, Whittington (‘The development of the crustacean nervous system’) gives a detailed overview of our present knowledge of crustacean neurogenesis, showing similarities with insect neurogenesis. Williams (‘The evolution and development of crustacean limbs: an analysis of limb homologies’) concludes this section with a chapter in which she discusses the approaches to homologise limb parts across crustaceans and other arthropods based on shared ontogenetic patterns.

In the third section ‘Morphology and phylogeny’, the two contributions illustrate what morphology and ontogeny can contribute to the phylogeny of Thecostraca (‘The complete cypris larva and its significance in Thecostracan phylogeny’ by Høeg, Lagerström & Glenner) and Branchiopoda (‘On the ontogeny of the Branchiopoda (Crustacea): contribution of development to phylogeny and classification’ by Olesen).

It is hard to find any shortcomings in this book. Coloured plates are gathered on the last pages of the book having black and white representations in the text. This is slightly inconvenient, but will have certainly lowered the costs of the book.

This book is an extremely important contribution to the integration of evolutionary and developmental biology of both crustaceans and arthropods. The compilation of present knowledge in this volume will facilitate many scientists and students in this rapidly expanding field of research.

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