Book review

HARPER, E.M., J.D. TAYLOR & J.A. CRAME, eds, 2000. The Evolutionary Biology of the Bivalvia. 494 pp. The Geological Society, London. ISBN 1-86239-076-2. £ 99 (c. 163 Euro).

This impressive book with 31 contributions provides a fine overview of frontiers in bivalve research. The book combines insights from very different disciplines, including palaeontology, molecular biology and ecology. The contributions are grouped in four themes, from which I will indicate some of the highlights.

Under the heading 'Bivalve classification and phylogeny' two chapters are devoted to the molecular phylogeny of bivalve genera and families. Both contributions agree more or less on the superfamily level, but the grouping of especially pterioid genera is not entirely in agreement. Two chapters deal with the classification of Palaeozoic bivalve groups. The shell-morphological characters seem hardly appropriate for cladistic analyses (an analysis of 61 taxa produced 411 most parsimonous trees), nevertheless they provide usefull insights into the early evolution of bivalve groups. Two chapters are devoted to sperm characteristics in classification. The phylogeny and evolution of two very distinct groups, i.e. the extinct Mesozoic reef-building rudists, and the carnivorous Anomalodesmata, are also treated.

Many new insights about the functional morphology of bivalves and its evolutionary context are documented in the second part of the book on 'Bivalve form and function'. Shell-morphological and anatomical characters related to chemosymbiosis in recent and fossil faunas are discussed. Other chapters deal with anatomy and feeding behaviour. The importance of larval shells for classification is once again underlined.

The third part, 'Biodiversity and Biogeography' was particularly illuminating. Two very different chapters emphasize our poor knowledge of supposedly well known faunas, and draw attention to implications for conservation. For example, in a contribution on the marine biodiversity of the Florida Keys it is shown that only 44% of the species found in that area were recorded in the literature, a percentage increasing to 73% when 'grey'-literature was taken into account. Collections contained only 77% of the total number of species, indicating that the literature and museum-collections only cannot provide an accurate estimate of species richness. The unravelling of cryptic diversity is greatly enhanced by molecular work, as is shown in a chapter on *Mytilus galloprovincialus*. Two other contributions deal with latitudinal and longitudinal diversity gradients. Seawater temperatures are a good predictor for bivalve species richness, which is also significantly influenced by historical (geological) processes.

The last part, on 'Ecological and evolutionary trends', contains a variety of contributions, including a morphological analysis of stratigraphicallly ordered crassatellids, estimating palaeotemperatures from fossil scallops by using stable isotopes and growth band densities (with important indications for cryptic diagenesis), experimental research dealing with so-called 'metabolic cold adaptation', burrowing behaviour related to predation pressure and composition and structure of musselbanks in an evolutionary perspective.

This book provides a state of the art insight into research topics dealing with evolutionary biology of the bivalves. It should be obligatory literature for anyone working with this very diverse group, from student to senior researcher. However, the high price may limit its availability, which is very regrettable indeed.

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