

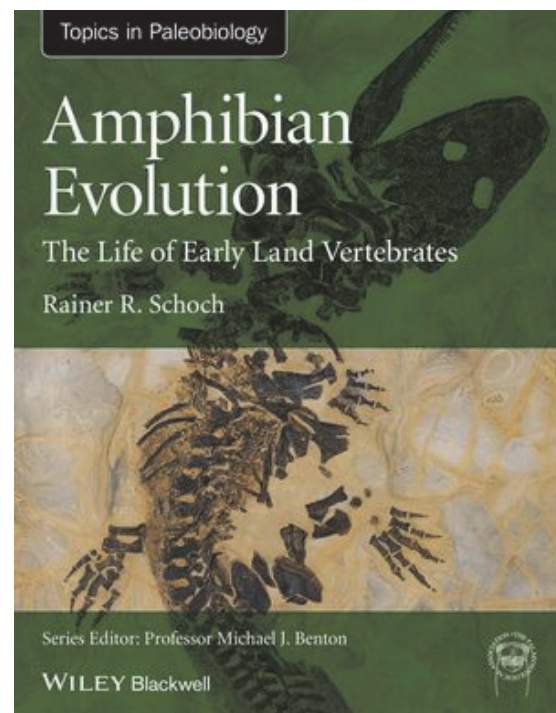
## Amphibian Evolution: The Life of Early Land Vertebrates

Review by Neil Brocklehurst

Rainer Schoch, 2014, Wiley-Blackwell. 276 pages, ISBN: 978-0-470-67177-1  
£39.99 (paperback), £80.00 (hardcover)

In *Amphibian Evolution*, Rainer Schoch presents one of the most comprehensive overviews of our current knowledge of the amphibian fossil record and the theories surrounding their evolution. Over the course of 10 chapters, a great variety of topics are addressed, from simple classification issues, morphology, and phylogeny to development, life history, and paleoecology. Although clearly aimed at paleontologists (the book is part of the *Topics in Paleobiology* series edited by Professor Michael Benton in association with the Palaeontological Association), there is much in the book to attract neontologists as well.

The first chapter comprises an introduction to the amphibians, briefly describing the major questions which will be addressed through the book. More specifically, it gives a concise introduction to the methods used by paleobiologists, and especially cladistics, explained in such a way that a reader unfamiliar with these concepts will be able to understand the ideas discussed later in the book. The second chapter comprises a summary of the various amphibian clades from the Devonian to the present day and their morphological characteristics. The chapter starts with an overview of vertebrate anatomy, with a focus on the skeleton, and then introduces each amphibian clade one by one. While the emphasis of the book is on the lissamphibians and their stem lineages (the temnospondyl amphibians), the lepospondyl clades and those on the amniote stem are not neglected. The third chapter then places these clades into context, detailing the environments in which these various



amphibian taxa are found. Various key localities and formations from each time period are discussed in detail, giving information on the geology, inferred environment, and observed fauna, whilst acknowledging the incompleteness and limitations of the fossil record.

Having given this overview of the animals under discussion and their fossil record, the remaining seven chapters each address a different

facet of amphibian life and evolution. Topics under discussion include the study of soft tissue anatomy in the fossil record, the evolution of the complex structures associated with a terrestrial lifestyle, development, ontogeny and life history, taphonomy and the inference of ecology in the fossil record, and amphibian phylogeny. Each of these topics is deliberated in great detail, with appropriate examples drawn both from modern amphibians and the fossil record. Areas of debate and disagreement are discussed in a fair and balanced manner. While the limitations of the paleontological methods are highlighted, the author provides many concise explanations of how these limitations may be overcome.

Overall this book should be recommended, not only to those interested in amphibian evolution, but to a wide range of evolutionary biologists. It provides a perfect example of many issues in which the paleontologist and the neontologist can work together to provide a thorough overview of a

clade's evolutionary history. If I had to find one criticism of it, I would say it is at times unclear what level of expertise the author is expecting from his reader. On the one hand, concepts such as cladistics, phylogenetic characters, ontogeny, and taphonomy are explained in such a way that the non-expert can follow. On the other hand, the author seems to expect the reader to already have a fairly detailed knowledge of vertebrate anatomy and development; the descriptions of amphibian morphology and the vertebrate skeleton in Chapter 2, for example, require the reader to have prior knowledge of the bones and muscles under discussion, as well as basic developmental processes. A prior knowledge of geology would also be useful when reading Chapter 3. On the whole, I think the book is most appropriate for researchers at the postgraduate or higher level who want an up-to-date summary of the state of research in their clade of interest, or possibly undergraduates who want an introduction to paleontological research.