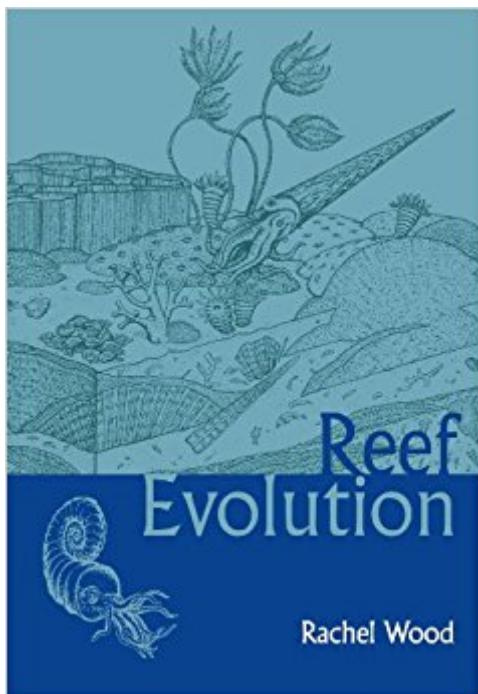


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# Reef Evolution



## Synopsis

If one does not understand the biology of the coral reef, one does not understand the reef at all. So, using more than 250 illustrations and specially drawn ecological reconstructions of reef communities, Rachel Wood provides a unique evolutionary approach to the understanding of ancient coral reef ecosystems. Marine organisms have aggregated to form reefs for over 3.5 billion years--creating the largest biologically constructed feature on earth, some visible from space. However, their study has been largely descriptive. *Reef Evolution*, documents the fundamental biological processes and innovations which have molded the evolution of reef ecosystems and given rise to the highly complex communities found today. The appearance of clonality, the acquisition of photosymbiosis, and the radiation of predator groups are all discussed in depth. Data from the fossil record documents the evolutionary development of reef ecosystems. Although reefs only occupy a small percentage of the oceans, their importance to the marine environment is many-faceted and global. They create harbors and allow the development of shallow basins with associated mangrove or seagrass communities; they protect coastlines from erosion; are involved in the regulation of atmospheric carbon, which in turn contributes to climate control. can provide extensive oil and gas reservoirs. From a biological standpoint, however, the great significance of reefs lies in their ability to generate and maintain a substantial proportion of tropical marine biodiversity. This unique interdisciplinary approach provides students and researchers in evolution, marine biology, ecology, paleontology, biodiversity, and geology with a text that will allow them to truly understand the biological innovations which have molded the evolution of coral reefs and given rise to the highly complex communities found today.

## Book Information

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## Customer Reviews

"Provides a broader and more integrative level of biological insight into the development of both ancient and modern reefs than the paleo-environmental and evolutionary discussions usually encountered in treatments of fossil reefs and reef organisms....[Wood's] positions are taken with zest and imagination, and logically supported. I expect to enjoy the ensuing debates as much as I enjoyed the book....I have a short book-shelf of key reference works that I consider particularly clear, comprehensive, and accessibly organized, and which I use as my starting point for exploring unfamiliar topics and linkages....Wood's book...is going straight into the 'short shelf.'"--Nature" In Reef Evolution, Rachel Wood takes on the difficult task of combining two traditionally isolated scientific realms, geology and biology. The outcome will impress different readers in different ways. . . . Reef Evolution is a mine of information for all who study coral reefs. . . . The book is easily read and delightfully free of technical jargon . . . It is set out in three parts: 'Introduction to reefs both ancient and modern' is almost entirely about ancient reefs. 'Environmental controls' has chapters on physicochemical change . . . and mass extinctions. 'Evolutionary innovation' mixes geological and biological perspectives . . . The glossary is good, and the breadth of literature reviewed is excellent. . . . The bottom line is that Reef Evolution is a scholarly production that carries both authority and credibility. . . . The result should be applauded by all who study reefs; it is destined to have a substantial impact on reef biology and geology alike."--Science" In the preface the author states that her goals were to 'emphasize fundamental processes and trends ... by documenting those biological innovations and environmental controls that ... have given rise to the highly complex communities found today.' The author has been able to do this by capturing those critical events in the history of life that have molded the evolution of reef systems. . . . The target audience of this book is clearly reef and carbonate geologists. However, I believe that all reef scientists (especially biologists) would be well served by having this book close at hand. . . . I recommend this book as a text for both upper level undergraduates and graduate students. In addition, it will serve as a useful reference and resource for many years to come. It is to be hoped that all carbonate geologists and reef scientists pick up and use this handsomely packaged and moderately priced book."--Journal of Carbonates & Evaporites

Rachel Wood, Royal Society Research Fellow, Gonville and Caius College, University of

All too often reefs have been described as merely geological phenomena. In her book, Rachel Wood takes a different approach missing for a long time: she treats reefs mainly from the biological perspective, i.e. as phenomena with biological interactions in its ecological community. Appropriate space is devoted to the discussion of reef-builder ecology (clonality vs. modularity), predators, herbivores, and symbionts. Part I of the book rather briefly (90 pp.) deals with reefs in Earth history and excessively (30 pp.) discusses the effects of mass extinctions on reefs. This chapter is oriented mainly at major episodes of constructor consortia blooms, whereas times of reduced reef growth do not receive much attention (although the discussion of the reasons for this reduction seem at least as interesting). Part II of the volume (40 pp.) is concerned with environmental controls of reef growth and does not provide much new information; nonetheless, these issues need to be mentioned within the given scope. Part III certainly is the most interesting and supplies the reader with several new interpretations of biological interactions in reefs: Growth form and autecology of reef builders are seen in close correlation; the role of biological disturbance is discussed at length; the origins and consequences of photosymbiosis are treated as well as the means and ways of competition among reef organisms. With its 150 pages, this chapter is the most rewarding and well justifies buying this book. A few criticisms have to be raised, however. The contents are skewed towards the author's favourite subject (Archaeocyatha); the importance of bioerosion is not stressed adequately and remains rather sketchy; the geological time-scale used is a little outdated; and the ethymologically incorrect form "microbialite" (instead of microbolite) is used throughout. Nonetheless, the text is very well-structured and arranged logically, with meaningful headings providing rapid orientation. An index further contributes to the easy access. Up-to-date references and a glossary for the non-specialist are additional positive features. All in all, this volume is well worth reading from the first to the last page for everyone interested in this fascinating facet of biological and physical interaction. Compulsory for the palaeontology teacher, and at least every library focussing on Earth Sciences should have it available! M. Bertling

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