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Review: Corals of the World by J.E.N. Veron and Mary Stafford-Smith

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BOOK REVIEW

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Corals of the World. 2000. J. E. N. Veron (author) and Mary Stafford-Smith (editor and producer), Australian Institute of Marine Science, PMB 3, Townsville Mail Centre, Queensland 4810, Australia. 3 volumes, 1382 p. Email: corals@aims.gov.au; web address: http://www.aims.gov.au/corals. US$175.00 or AU$265.00 set; discounts available for conservation and research organizations; student subsidies available.

Staghorn Corals of the World: A Revision of the Genus Acropora. 1999. Carden C. Wallace, CSIRO Publishing, P.O. Box 1139, Collingwood, Victoria 3066, Australia; OR Antipodes Books and Beyond, Ltd., 9707 Fairway Avenue, Silver Spring, MD 20901, USA. 421 p. Email: sales@publish.csiro.au; web address: http://www.publish.csiro.au; OR Email: antipode@antipodesbooks.com. AU$140.00; CD-ROM to accompany book available for AU$130.00.

Learning to identify scleractinian corals requires years of study, but understanding their evolutionary relationships is truly a daunting task. Those of us working on the depauperate reefs of the Caribbean have until recently solaced ourselves with the thought that at least we did not have to learn the wildly diverse Indo-Pacific corals. Lately, however, even the Caribbean corals have become problematic. For example, morphotypes of the "species" *Montastraea annularis* may in reality be members of a species complex or at least the intermediate products of ongoing speciation events.

In *Corals of the World,* Charlie Veron takes on the challenge of covering all the genera of reef-building corals worldwide. This privately published, three-volume set is simply spectacular, with literally thousands of color photographs of coral colonies at different magnifications, maps of geographic distributions, and drawings of corallite morphologies. There is no doubt that this set will be the standard for reef-coral identification for decades to come. Much of the credit for its success belongs to Mary Stafford-Smith, who has done a superb job of editing and producing these volumes.

Volume 1 begins with introductory sections on the ecology of coral reefs, the history of reef building through geological time, and the biology of the corals themselves. The rest of the volume is given over to the family Acroporidae, the most diverse and numerically important group of scleractinians on modern coral reefs. The genus *Acropora* alone contains 170 species in Veron's treatment.

Volumes 2 and 3 cover the rest of the coral families. Those concerned about distinguishing members of the *Montastraea annularis* species complex, currently split into *M. annularis, M. faveolata,* and *M. franksi,* will not find much comfort; Veron lists only *M. annularis* and briefly mentions this continuing controversy in a taxonomic note. Likewise, there are three "species" of *Porites* from the Caribbean that have a similar, branching morphology: *P. porites, P. furcata,* and *P. divaricata.* The first two species in particular remain difficult to distinguish both in the field and under the microscope, and, having originally been considered forms of *P. porites,* they probably should be lumped once again.

These problems are not Veron's fault. We are simply up against an epistemological barrier when it comes to identifying corals in certain genera. Veron wraps up Volume 3 by exploring the source of these ambiguities. He reviews his ideas about "reticulate evolution," the hypothesis that species complexes are formed by vicariance events but the species then exchange genetic information when their distributions overlap once more. Multiply anastomosing phylogenies imply that "species" of corals are something different from, say, species of mammals. Reticulate evolution could, therefore, account for the difficulties in separating coral species. A complete theoretical treatment can be found in Veron (1995). Although reticulate evolution sounds unlikely at first blush, it certainly should not be dismissed. Veron's set closes with keys to the genera and species at the end of Volume 3.

All told, *Corals of the World* is a great value. Those of us who only occasionally dip our toes into the tropical Indo-Pacific can find much help with species identifications of the Caribbean corals, and we can learn about the astonishing Order Scleractinia in all its Indo-Pacific glory.

Carden Wallace's *Staghorn Corals of the World* is a work of equal virtuosity, although it is more of a traditional monograph. The reader will find detailed information on 113 species of *Acropora,* including descriptions of five new species. Each species is illustrated with excellent black-and-white photographs and a map show-

ing its geographic distribution. There are also 24 color plates. A CD-ROM that includes an identification guide is available separately.

Wallace's taxonomic interpretations differ from those of Veron, who lists 57 more species of *Acropora.* This difference is not especially relevant to the Caribbean coral fauna, however. It has long been common knowledge that there are three species of *Acropora* in the Caribbean and that they are all endemic to the region. Both Wallace and Veron raise the issue that one of these, *A. prolifera,* is probably a hybrid of the other two, *A. palmata* and *A. cervicornis.* A number of investigators had previously suspected that this was the case, and ongoing genetic analysis by Steven Vollmer, a graduate student at Harvard University, strongly supports the hypothesis that *A. prolifera* is a hybrid.

In addition to the species descriptions, Wallace's book contains detailed information on the physiology, reproduction, ecology, and stratigraphic ranges of *Acropora* spp. A section on evolutionary relationships is replete with cladistic analyses. Wallace explores phylogenetic hypotheses by mapping stratigraphic and biogeographic distributions onto her cladograms. This is no mere academic exercise; *Acropora* is the most prominent coral genus on today's reefs. Understanding why *Acropora* is ubiquitous will help us evaluate the hypothesis of reticulate evolution and answer other evolutionary questions about corals and associated reef organisms.

The irony, of course, is that such wonderful books about reef corals are being published at a time when corals, and indeed entire reef systems, are under threats ranging from bomb-fishing in Indonesia, which destroys localized patches of reef, to global warming, which seems destined to cause mass coral bleaching on a regular basis. Outbreaks of white-band disease have drastically reduced populations of *Acropora* spp. in the Caribbean, and recovery, if it occurs, could take decades. The incidence of white-band disease is now increasing within populations of *Acropora* in the Indo-Pacific. Veron's and Wallace's books remind us of why we should care about reefs and the corals that build them.

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