Book reviews

Dynamic Aquaria: Building Living Ecosystems

Without doubt more a textbook than an aquarium manual, the second edition of Dynamic Aquaria contains a wealth of information for researchers, professional aquarists, and hobbyists. Adey and Loveland take the ecosystem approach to aquarium design and maintenance focusing on recreating enclosed aquatic ecosystems designed to match as closely as possible their “wild analogs”. But what to some may be one of this book’s strongest points – the mass of background information from plate tectonics to the structure nephron cells – may to others prove a distraction from getting to the practical issues and frustrations of building aquaria.

The book is divided into five sections with a final summary. The first considers the physical environment, including the materials used to construct aquaria, the role of substrata such as rock, mud and sand, water composition and the inputs of energy from both lighting and feeding. The second section deals with the so-called biochemical environment. This begins with a discussion of metabolism, then considers gas exchange and the ramifications of water pH. Nutrient limitation and eutrophication are then reviewed, followed by a discussion of biomineralisation and calcification. Finally, various means of controlling this biochemical environment are discussed with particular emphasis placed on the use of algal turf scrubbers rather than bacterial filters or foam fractionation (protein skimming). The authors then move on to describe the so-called biological structure from the community level through trophic dynamics and food webs to a series of chapters that describe each trophic level in turn. The fourth section of the book describes some examples of ecological systems that have been modelled in aquaria, tropical coral reefs, subarctic shorelines, estuarine systems, and three freshwater models.

The fifth section, newly written for the second edition, describes two applications of the “dynamic aquaria” approach outlined in this book. The first is the culture of organisms especially for the aquarium trade. Using the example of the tropical coral reef, the authors quite rightly point out the paradox between the great value of aquaria to raise awareness of a threatened ecosystem, and the danger of some aquaria relying on unsustainable specimen collection in the field. They outline ideas that may help culture reef species and so remove the need to rely on collecting. The second major application described is the use of algal turf scrubbers in the treatment of waste water. These

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systems will typically contain tens of species of algae and many microbe and invertebrate species with human operators as grazers and top predators responsible for periodically removing biomass. This intriguing approach has now been tested on an industrial scale in the USA to treat waste water from domestic, agricultural and aquaculture systems.

As with the first edition, Dynamic Aquaria can be criticised for trying to be all things to all people. The authors say they are writing with researchers, professional aquarists, and hobbyists in mind. While the large amounts of space given over to background information may frustrate some researchers hoping for pointers on practical aquarium problems, this book does on balance remain a useful summary for readers without easy access to this information and to those who need a clear, thorough review of the subject. The central idea of developing aquarium mesocosms for either experimental, display or specialised industrial purposes is well argued and, with the increasing need to work sustainably and with minimal environmental impact, is very timely.

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The Biology of Mangroves
By Peter J. Hogarth; Oxford University Press, Oxford; 1999; 228 pp; US $75 (Hbk); $34.95 (Pbk); ISBN 0-19-850223-0 (Hbk); ISBN 0-19-850222-2 (Pbk)

This book is a worthy contribution to the Biology of Habitats series published by Oxford University Press. The book is a well-written, introductory text covering a wide range of topics, including how mangroves cope with environmental stress; terrestrial and marine food chains; primary production and its fate in adjacent marine systems; biodiversity and biogeography; and human impacts. Hogarth has written a timely volume, given the growth of mangrove research since the 1980s, and the need for an introductory book to update the few, more advanced, treatises on mangrove ecology. This is the first book that can be realistically used as an undergraduate textbook on the subject or as part of a course on tropical or marine ecology, or read by those requiring an introduction to the role of mangroves in the tropical biosphere.

Like other introductory texts, the need to generalize major concepts has resulted in some inaccuracies. For instance, not all mangroves are a suitable substrate for oysters and barnacles, or are the source of significant methane production.

The first two chapters are devoted to the global and intertidal distribution of mangroves, and how trees cope physiologically with salt and other stressors, including