Book review

Enfoques contemporáneos para el estudio de la biodiversidad1 (Current Approaches to the Study of Biodiversity)


Biodiversity is the subject of much research and discussion. Many recent books include the word ‘biodiversity’ in their titles (e.g., Wilson 1988; Gaston 1996; Reaka-Kudla et al. 1996; Becher 1998; Gaston and Spicer 1998; McKinney and Drake 1998; Hubbell 2001). It figures among the most fashionable topics in many leading scientific journals (including some special issues; see for example, Nature 405: 207–253), and several specialized journals are explicitly devoted to this subject (e.g., Biodiversity and Conservation, Diversity and Distributions). This growing interest in describing, understanding, and managing biodiversity has been triggered, at least in part, by the dramatic effects that humans are having on it. The subject matter of the science of biodiversity includes ecological, genetic and organismal diversity at all levels of organization. Therefore, the study of biodiversity is broad in scope and borrows from many traditional fields of biology. For this reason, an overview of the approaches used to study biodiversity should be equally broad and encompassing. Enfoques contemporáneos para el estudio de la biodiversidad is an attempt to provide such an overview.

The book is the result of a symposium held to commemorate the 70th anniversary of the Institute of Biology of the Universidad Nacional Autónoma de México, a leading institution in biological research in Latin America. As the title of the book suggests, and as the director of the institute makes clear in his preface, the book aims to present an overview of different approaches used to study biodiversity, with the hope of stimulating young students to pursue this area of research.

The book has been written in Spanish, which required the translation of most chapters, originally written in English. The Spanish translation is generally good (though not perfect); it is noteworthy that an effort has been made to find appropriate Spanish equivalents of English technical terms – which unfortunately is not a common practice nowadays. Chapters have been written by well-known scientists who have made important contributions in their fields of study and are in many cases co-authored by younger Mexican researchers. Most chapters (probably with the sole exception of Paul Ehrlich’s essay) are original contributions specially written for this volume. Thus, the book represents an authoritative, well-written, original account of current research in
the field of biodiversity, and it has the potential to reach a broad audience of university students and professional biologists in Spanish-speaking countries. The fact that most scientific literature is written in English poses a significant obstacle for many undergraduate students who do not speak this language. Efforts like the one undertaken by Hernández et al. will help these students to bridge this gap.

The book consists of 15 essays on different topics related to the general subject of biodiversity. A major theme in the book is the discussion of current methods for the study of biodiversity, including cladistic approaches to test phylogenetic hypotheses (Nixon and Ochoterena), phylogenetic methods used to address evolutionary questions (Pellmyr et al.; Maddison and Pérez; Hormiga and Coddington), methods used in the estimation of global species richness (Reaka-Kudla), molecular methods of phylogenetic reconstruction (Spooner and Lara-Cabrera), anatomical studies used to understand patterns of diversification in plants (Mauseth), and methods for modeling species distributions (Sánchez-Cordero et al.).

Another recurrent theme is the importance of ‘classical’ taxonomic and systematic research for the understanding and conservation of biodiversity. This is the central theme of Ehrlich’s essay and is also addressed in several other chapters in the context of coral reefs (Reaka-Kudla), parasites (Brooks et al.), floristic projects (Knapp et al.), and the modeling of species distributions (Sánchez-Cordero et al.). From different perspectives, all these authors convincingly argue that we desperately need systematists and their knowledge if we want to understand and manage biodiversity. After reading this book, it is difficult to disagree with the claim of Krebs (2001: 436) that ‘taxonomists are the heroes of biodiversity, and without them working quietly in the background we would not know even the 10% (of species) we do, and our appreciation of community organization and dynamics would be much reduced.’

Another set of chapters deals with processes involved with the generation of biodiversity, such as the role of breeding systems in angiosperm evolution (Holsinger), processes favoring diversification and extinction of amphibian taxa (Green et al.), and the role of species interactions in the diversification of taxa (Pellmyr et al.; Brooks et al.). Finally, several chapters discuss taxonomic or distributional patterns in the biodiversity of particular taxa (such as amphibians, Green et al.; fungi, Lodge; lichens, Herrera-Campos and Nash III) or biomes (coral reefs, Reaka-Kudla). Thus, the book represents a good source of information for those interested in learning how biodiversity is studied, what the major obstacles are for improving our knowledge, and what role classical taxonomy and systematics can play in the current efforts to find solutions to the biodiversity crisis.

The book is not free of problems, however. A major limitation of this volume is that some important approaches to the study of biodiversity are completely missing. For example, although Reaka-Kudla discusses regional patterns of diversity in the context of coral reefs, there is no general account of the regional patterns of biodiversity and what determines them. Similarly, although Green et al. discuss temporal patterns of biodiversity for the particular case of amphibians, no general
An overview of temporal patterns of biodiversity through the history of life is given. Furthermore, it is surprising that there is no discussion of some of the central questions of ecological research. There is no mention of the relationship between biodiversity and stability or ecosystem processes; and although there has been much discussion of the importance of species interactions for the maintenance of diversity, the issue is only tangentially addressed in two chapters (Pellmyr et al.; Brooks et al.). In addition, although it is emphasized repeatedly that taxonomy and systematics are important tools to fight current threats to biodiversity, not much is said about what those threats are. True, the issue is addressed in some chapters (by Reaka-Kudla in the context of coral reefs, and by Green et al. for the specific case of amphibians); but there is no comprehensive treatment of the threats that current human-caused global changes (such as habitat destruction, species introductions, or climate change) pose to biodiversity. Thus, although the editors have put together a fine collection of original essays written by well-known scientists, the book as a whole does not provide a balanced account of the approaches used in the study of biodiversity.

The book also lacks an opening chapter introducing the concept of biodiversity – what it is, why it is important to study it, how it is measured, what are the consequences of losing it. Although readers can find the answer to these questions elsewhere (see references in opening paragraph), it would have added an enormous value to the book to have it all there, in Spanish. There is also a lack of thematic organization of the chapters. Chapters are simply listed in a table of contents, but there is no grouping of chapters in sections reflecting some unifying theme (it took me some time to classify the chapters in the different thematic groups I presented above). Given that a main objective of the book is to serve as a tool for students, this lack of organization constitutes another limitation of this volume.

I would recommend this book not only to undergraduate and graduate students, but also to any biologist seeking a good account of current approaches to the study of biodiversity. However, I would stress that the book is not a comprehensive summary of all research approaches to the study of biodiversity.

Note

1Una versión en castellano de esta revisión puede ser solicitada al autor (vazquez@utk.edu).

References

Becher A (1998) Biodiversity. ABC-CLIO, Santa Barbara, California

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