

Book review

Evolutionary biogeography of Chile

Plant Geography of Chile. By Andrés Moreira-Muñoz. Springer, New York, USA, 2011, 343 pp. US\$209.00 (hardcover). ISBN 978-90-481-8747-8.

Twenty-five years ago, I travelled for the first time to Chile. I was collecting the weevils (Coleoptera: Curculionidae) that I had just begun studying for my PhD dissertation. Over the years, I went back to the country several times, travelling as far as the Strait of Magellan, and fell in love with its weird geography (see Subercaseaux, 1940), friendly people, and interesting plant and animal taxa. Although I now live on the Antipodes of the Latin American homeland, the Chilean biota continues to attract me, especially the biogeographical patterns exhibited by many Chilean taxa. Andrés Moreira-Muñoz has written a book on the evolutionary biogeography of Chile, from the viewpoint of plants.

The book is organized in five parts and 11 chapters. Part I (“Geobotanical scenario”) is an overview of the geographical and botanical knowledge on the Chilean vascular plants in the present and the geological past. The first chapter (“The extravagant physical geography of Chile”) deals with the main geographical characteristics of the Chilean territory, especially referring to the tectonic evolution of southern South America, the geological and climatic changes that have affected the biome configuration (with special reference to the Pleistocene glaciations), and the vegetation formations. The second chapter (“Getting geobotanical knowledge”) reviews the historical development of Chilean botany and analyses current knowledge of the floristic composition of the country. From the discovery of the Strait of Magellan in the 16th century to the different naturalists who explored the country, the growth in botanical knowledge is reviewed. Then the plant taxa are presented phylogenetically, from lycophytes to eudicots.

Part II (“Chorology of Chilean plants”) analyses biogeographical relationships from the viewpoint of plant taxa. Chapter 3 (“Geographical relations of the Chilean flora”) classifies the floristic elements of the Chilean flora, especially analysing the disjunct distributional patterns. To refer to the comparative analysis of distributional patterns, the author uses the term “chorology”, which agrees with the normal use in biogeography (e.g. Cain, 1944) and contrasts with a more recent

idiosyncratic use (Ebach and Goujet, 2006; Williams, 2007). Floristic elements of the Chilean flora are classified into Pantropical, Australasiatic, Neotropical, Antitropical, South-temperate, Endemic, and Cosmopolitan, and a track or panbiogeographical approach is used to exemplify them. Molecular dating and the dispersal/vicariance dichotomy are discussed in relation to biogeographical disjunctions. Chapter 4 (“Biogeographical regionalization”) refers to the regionalization of the country. Biogeographical regionalization results in a hierarchical arrangement of biotic components, to which categories such as realm, region, or province are assigned. After discussing some previous regionalizations, the author refers to the Austral and Neotropical floristic realms and to the regions and provinces of the country. Based on the analysis of the Chilean endemic plant genera with NDM/VNDM (Szumik and Goloboff, 2004), three areas of endemism are obtained and compared with previously delimited provinces.

Part III (“Island biogeography”) provides an analysis of island biogeography and conservation biogeography. Chapter 5 (“Pacific offshore Chile”) synthesizes the biogeographical patterns exhibited by the Chilean Pacific offshore islands, namely Rapa Nui (Easter Island), the Desventuradas archipelago (San Félix and San Ambrosio islands), and the Juan Fernández archipelago (Alejandro Selkirk or Masafuera Island and Robinson Crusoe or Masatierra Island). The Juan Fernández archipelago is particularly interesting from a biogeographical viewpoint due to its endemism and relationships with some Subantarctic areas. The threatened status of the flora of these islands and the possibilities of conservation and restoration are discussed. Chapter 6 (“Islands on the continent: conservation biogeography in changing ecosystems”) analyses habitat fragmentation in the mainland due to human impact. Several concepts from the emerging field of conservation biogeography (Whittaker et al., 2005; Luna-Vega et al., 2010) are applied in relation to current global changes. Threats and conservation opportunities in the Chilean territory are explored using modern approaches such as systematic conservation planning and priority site selection.

Part IV (“Case studies on selected families”) refers to case studies of three specific taxa. Chapter 7 (“Cactaceae, a weird family and postmodern evolution”) deals

with the Chilean species of a characteristic American family, the Cactaceae. Chapter 8 (“Asteraceae, Chile’s richest family”) turns to the speciose Asteraceae, which is the richest family in the country, both in generic and specific taxa. Chapter 9 (“*Nothofagus*, key genus in plant geography”) deals with the monotypic family Nothofagaceae.

Part V (“Where to from here? Projections of Chilean plant geography”) ends the book by discussing several ways in which Chilean biogeography can develop further in the near future. Chapter 10 (“All the possible worlds of biogeography”) speculates on the situation of modern evolutionary biogeography, discussing the possibilities for integrating different approaches and methods into one coherent programme. According to the author, the so-called “crisis of biogeography” seems to be related to a more general crisis of reductionism. Although I fully support an integrative pluralistic approach over simpler, more mechanistic approaches, I doubt that “post-modern biogeography” and “deconstruction” have anything to offer to biogeography (or maybe I am getting old!). Chapter 11 (“Epilogue: The Juan Fernández islands and the long distance dispersal of Utopia”) is a digression on science and the artificial distinction between nature and culture.

I really enjoyed reading this book. It contains an impressive amount of information. As stated by the author in the Preface, it explores different (and conflicting) approaches that have been proposed to explain biogeographical patterns, suggesting that the vicariance/dispersal dichotomy is just too simple a problem design to deal with the complexities of evolutionary

biogeography. This book should be read by biogeographers, systematists, naturalists, ecologists, and any other person interested in biogeography and evolution.

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Juan J. Morrone

Departamento de Biología Evolutiva, Facultad de Ciencias, Museo de Zoología “Alfonso L. Herrera”, Universidad Nacional Autónoma de México, Apdo. Postal 70-399, 04510 Mexico, D.F., Mexico
E-mail address: juanmorrone2001@yahoo.com.mx