Biogeography of Microscopic Organisms

Is Everything Small Everywhere?

Bringing together the viewpoints of leading experts in taxonomy, ecology and biogeography of different taxa, this book synthesises discussion surrounding the so-called 'Everything is everywhere' hypothesis. It addresses the processes that generate spatial patterns of diversity and biogeography in organisms that can potentially be cosmopolitan.

The contributors discuss questions such as: are microorganisms (e.g. prokaryotes, protists, algae, yeast and microscopic fungi, plants and animals) really cosmopolitan in their distribution? What are the biological properties that allow such potential distribution? Are there processes that would limit their distribution? Are microorganisms intrinsically different from macroscopic ones? What can microorganisms tell us about the generalities of biogeography? Can they be used for experimental biogeography?

Written for graduate students and academic researchers, the book promotes a more complete understanding of the spatial patterns and the general processes in biogeography.

DIEGO FONTANETO is a NERC Advanced Research Fellow at the Division of Biology, Imperial College London, Ascot, UK. His research focuses on spatial patterns and processes in microscopic animals, with a particular interest in rotifers.

The Systematics Association Special Volume Series

SERIES EDITOR

DAVID J. GOWER

Department of Zoology, The Natural History Museum, London, UK

The Systematics Association promotes all aspects of systematic biology by organising conferences and workshops on key themes in systematics, running annual lecture series, publishing books and a newsletter, and awarding grants in support of systematics research. Membership of the Association is open globally to professionals and amateurs with an interest in any branch of biology, including palaeobiology. Members are entitled to attend conferences at discounted rates, to apply for grants and to receive the newsletter and mailed information; they also receive a generous discount on the purchase of all volumes produced by the Association.

The first of the Systematics Association's publications *The New Systematics* (1940) was a classic work edited by its then-president Sir Julian Huxley. Since then, more than 70 volumes have been published, often in rapidly expanding areas of science where a modern synthesis is required.

The Association encourages researchers to organise symposia that result in multi-authored volumes. In 1997 the Association organised the first of its international Biennial Conferences. This and subsequent Biennial Conferences, which are designed to provide for systematists of all kinds, included themed symposia that resulted in further publications. The Association also publishes volumes that are not specifically linked to meetings, and encourages new publications (including textbooks) in a broad range of systematics topics.

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EDITED BY

DIEGO FONTANETO

Imperial College London

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Contents

Contributors

Tom Artois Centre for Environmental Sciences, Hasselt University, Diepenbeek, Belgium

Ibrahim M. Banat School of Biomedical Sciences, University of Ulster, Coleraine, Northern Ireland, UK

David Bass Zoology Department, The Natural History Museum, London, UK

Jens Boenigk General Botany, University Duisburg-Essen, Essen, Germany

Juliet Brodie Department of Botany, The Natural History Museum, London, UK

Luc De Meester Laboratory of Aquatic Ecology and Evolutionary Biology, Katholieke Universiteit Leuven, Leuven, Belgium

Isabel Draper Departamento de Biología (Botánica), Facultad de Ciencias, Universidad Autónoma de Madrid, Madrid, Spain

Wilhelm Foissner FB Organismische Biologie, Universität Salzburg, Salzburg, Austria

Diego Fontaneto Department of Invertebrate Zoology, Swedish Museum of Natural History, Stockholm, Sweden, and Division of Biology, Imperial College London, Ascot, UK

Rima B. Franklin Department of Biology, Virginia Commonwealth University, Richmond, VA, USA

Andrea Franzetti Department of Environmental Sciences, University of Milano-Bicocca, Milano, Italy

Philip F. Ganter Department of Biological Sciences, Tennessee State University, Nashville, TN, USA

József Geml National Herbarium of the Netherlands, Netherlands Centre for Biodiversity Naturalis, Leiden University, Leiden, the Netherlands

Noemi Guil Department of Biodiversity and Evolutionary Biology, National Museum of Natural History (CSIC), Madrid, Spain

Thierry J. Heger WSL, Swiss Federal Institute for Forest, Snow and Landscape Research, Ecosystem Boundaries Research Unit, Wetlands Research Group, Lausanne, Switzerland; Laboratory of Ecological Systems, École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland; Department of Zoology and Animal Biology, University of Geneva, Geneva, Switzerland; and Biodiversity Research Center, University of British Columbia, Vancouver, Canada

JOAQUÍN HORTAL Departamento de Biodiversidad y Biología Evolutiva, Museo Nacional de Ciencias Naturales (CSIC), Madrid, Spain, and Azorean Biodiversity Group - CITA A, Department of Agricultural Sciences, University of the Azores, Angra do Heroísmo, Terceira, Açores, Portugal

WILLIAM D. HUMMON Department of Biological Sciences, Ohio University, Athens, OH, USA

DAVID G. JENKINS Department of Biology, University of Central Florida, Orlando, FL, USA

DONNABELLA C. LACAP School of Biological Sciences, The University of Hong Kong, Hong Kong SAR, China

ENRIQUE LARA Institute of Biology, Laboratory of Soil Biology, University of Neuchâtel, Neuchâtel, Switzerland

FRANCISCO LARA Departamento de Biología (Botánica), Facultad de Ciencias, Universidad Autónoma de Madrid, Madrid, Spain

MAGGIE C.Y. LAU School of Biological Sciences, The University of Hong Kong, Hong Kong SAR, China

ROGER MARCHANT School of Biomedical Sciences, University of Ulster, Coleraine, Northern Ireland, UK

SANDRA J. MCINNES British Antarctic Survey, Cambridge, UK

NAGORE G. MEDINA Departamento de Biología (Botánica), Facultad de Ciencias, Universidad Autónoma de Madrid, Madrid, Spain

KIM A. MEDLEY Department of Biology, University of Central Florida, Orlando, FL, USA

EDWARD A.D. MITCHELL Institute of Biology, Laboratory of Soil Biology, University of Neuchâtel, Neuchâtel, Switzerland

STEPHEN B. POINTING School of Biological Sciences, The University of Hong Kong, Hong Kong SAR, China

HANNO SCHAEFER Ecology and Evolutionary Biology, Imperial College London, Silwood Park Campus, Ascot, UK, and Organismic and Evolutionary Biology, Harvard University, Cambridge, MA, USA

MARTIN V. SØRENSEN Natural History Museum of Denmark, Zoological Museum, Copenhagen, Denmark

M. ANTONIO TODARO Dipartimento di Biologia, Università di Modena and Reggio Emilia, Modena, Italy

SILKE WERTH Biodiversity and Conservation Biology, WSL Swiss Federal Research Institute, Birmensdorf, Switzerland

DAVID M. WILLIAMS Department of Botany, The Natural History Museum, London, UK

ALDO ZULLINI Dipartimento di Biotecnologie & Bioscienze, Università di Milano-Bicocca, Milan, Italy

Preface

This volume is derived from a symposium on 'The importance of being small: does size matter in biogeography?' organised during the first BioSyst meeting, which was held in Leiden in August 2009. The idea for the symposium arose during an informal discussion at the Natural History Museum in London. Biogeography is now a well-established science with its own methods and tools, and a strong theoretical framework. Many journals and books are dedicated to biogeography, and specific meetings are organised by the International Biogeography Society. Nevertheless, most of the ideas in biogeography come from empirical evidence from macroscopic organisms, whereas the spatial patterns of microscopic organisms have mostly been neglected.

The aim of this book is to establish the importance of microorganisms in biogeography. In doing so, this book follows the stimulating discussion on the so-called 'Everything is everywhere' hypothesis of the last decades. Currently, enough empirical evidence is available on the biogeography and phylogeography of many microscopic organisms and on larger organisms with microscopic dispersing stages; thus, this book brings together for the first time all this information in a unifying framework, and discusses patterns, processes and consequences.

The coverage of the taxa is broad, spanning from prokaryotes to plants, fungi, and animals; the approaches are rather different in the different chapters, and I hope that readers will enjoy this book and find many inspirations for their own research.

I am very grateful to the Systematics Association for the opportunity to organise the symposium in Leiden and especially to Juliet Brodie, Peter Olson, Dave Roberts and Alan Warren for their support at an early stage of the organisation of the meeting. Other people were very helpful during the meeting, and I am very grateful to Peter Hovenkamp for his help in Leiden. As for any meeting, its success was due to the high quality of the speakers, and I thank them all.

During the preparation of the book, I received strong support both from the Systematics Association, William Baker, Richard Bateman and David Gower, and from Cambridge University Press, Katrina Halliday, Dominic Lewis and

Megan Waddington. The contributors made a great job in providing interesting, stimulating and easily readable chapters on schedule, and I am very grateful to them. They also provided valuable assistance during the reviewing process. Other people read part of the book and provided comments and suggestions, and for that I sincerely thank Tim Barraclough, Lars Hedenäs, Seraina Klopfstein, Petra Korall, Marc-André Lachance, Ulrike Obertegger, Ibai Olariaga Ibarguren, Maureen O'Malley, Albert Phillimore, Brett Riddle, Cuong Tang, Franco Verni, Martin Westberg, Chris Wilson and others who prefer to remain anonymous.

Diego Fontaneto
Stockholm
Sweden