



ECOLOGY

HOW SPECIES INTERACT: ALTERING THE STANDARD VIEW ON TROPHIC ECOLOGY.

By Roger Ardit and Lev R. Ginzburg. Oxford and New York: Oxford University Press. \$59.00. xiii + 170 p.; ill.; index. ISBN: 978-0-19-991383-1. 2012.

Predator-prey interactions have been a staple of ecological modeling, laboratory, and field studies since the classic papers of Alfred Lotka and Vito Volterra in the late 1920s. I have loosely referred to the reverence ecologists have for Lotka and Volterra as the “curse of Lotka and Volterra” because it has too often instilled in ecologists the assumption that if a model mimics a pattern found in nature, the model must be correct. Ardit and Ginzburg have ridden to the rescue of we Lotka skeptics with an alternative view of trophic interactions, the ratio-dependent model of predator-prey interactions. They have brought together a set of scattered ideas that stretched back to the 1930s, but were never systematically analyzed for their implications about how species interactions might operate. This book is a fine example of how thinking conceptually can be stuck in an old paradigm that is in large part an incorrect description of trophic interactions and the difficulties scientists can face in suggesting a new paradigm.

The authors have been pushing the advantages of ratio-dependent predation models since the 1970s. They were successfully ignored until about 1989 when their “heresy” was recognized as a new synthesis that has now become a new paradigm of species interactions. The details are described very well in this short book, and the consequences of recognizing ratio-dependence in consumer-resource interactions result in a reevaluation of many of ecologists’ treasured models and generalizations. A striking example lies in the paradox of enrichment, the question of what happens to food chains when additional production is stimulated at lower trophic levels, for example, by adding nutrients to lakes or the ocean. The classic Lotka model predicts a different set of community responses from the ratio-dependent model. Ardit and Ginzburg review field and laboratory studies that provide tests of the predictions of the classical model and the ratio-dependent model and conclude that the data are more consistent with the ratio-dependent view of species interactions. Along the way, we find out that the classical Hairston-Smith-Slobodkin model (based on the classical Lotka model) makes some incorrect predictions and that Oksanen’s ex-

ploitation ecosystems hypothesis may also be incorrect. As always, the devil is in the details, and the strength of this volume is that it confronts theory with laboratory and field studies and shows how the predictions of each theory are supported or not.

For ecologists interested in species interactions, this small book is both an important and a delightful read that I predict heralds a paradigm shift in ecological thinking. As such, it can be read as a model of how theoretical ecology and empirical ecology should move hand in hand.

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ENCYCLOPEDIA OF INVASIVE SPECIES: FROM AFRICANIZED HONEY BEES TO ZEBRA MUSSELS. Volume 1: Animals and Volume 2: Plants.

By Susan L. Woodward and Joyce A. Quinn. Greenwood. Santa Barbara (California): ABC-CLIO. \$189.00 (two-volume set). Volume 1: xli + 320 p.; ill. + I-1-I-38 (index); Volume 2: xxv + pp. 321-764; ill.; index. ISBN: 978-0-313-38220-8. 2011.

BIOLOGICAL INVASIONS: ECONOMIC AND ENVIRONMENTAL COSTS OF ALIEN PLANT, ANIMAL, AND MICROBE SPECIES. Second Edition.

Edited by David Pimentel. Boca Raton (Florida): CRC Press (Taylor & Francis Group). \$119.95. xiv + 449 p.; ill.; index. ISBN: 978-1-4398-2990-5. 2011.

These three volumes examine invasive species, those species that have been introduced accidentally or deliberately outside their native range and negatively impact human or environmental health. *Encyclopedia of Invasive Species* takes a species-by-species approach and is separated into two volumes—one on microorganisms, fungi, and animals and one on plants. It only includes species invasive in the United States and Puerto Rico. *Biological Invasions* takes a geographic approach and examines the ecological and economic costs of plants and animals in eight regions: Australia, Brazil, British Isles, Europe, India, New Zealand, South Africa, and the United States.

Encyclopedia of Invasive Species is aimed at high school and college students as well as concerned citizens interested in the “origins and consequences” of invasive species. The two volumes are written in a very accessible way with the same elements of information included for each of the three microorganisms, six fungi, 36 invertebrates, 43 vertebrates, and 80 plants covered. Each entry has a description of the native range and includes: a range map; the geographic and habitat distribution within the United States; a description and