



Book reviews

G. Brundu, J. Brock, I. Camarda, L. Child and M. Wade (eds.), 2001. **Plant invasions: Species Ecology and Ecosystem Management**. 338 pages with 127 figures and 80 tables. Backhuys Publishers, Leiden. ISBN 90-5782-080-3. Paperback; price: EUR 93.00/USD 89.00

Invasive plants created difficult problems in a wide range of life, like biodiversity conservation, agricultural economy and human health. As most of the scientists agree, the major driving force that promotes plant (and animal) invasions is global change considered in the broad sense, that is: human induced climate change, globalization of trade, land use modification, increased nitrogen deposition, and direct (though often undesigned) contribution to invasions themselves. Since these processes are very much likely to increase further, in the near future we must face with an even higher extent of plant invasions. Scientists recognized the threat and responded with increasing research activity indicated by the increasing number of papers published in the last five years: 10 (1997), 24 (1998), 22 (1999), 31 (2000) and 42 (2001) - with search term: plant(s) invasion OR invasive plant(s); data from ISI Database. However, the number of important species and regions colonized are so high that many of them still have not received a single study. Therefore, the present multi-authored book makes a valuable and distinctive contribution to fill the gaps in our knowledge about invasive plants.

The 34 contributions are grouped under five chapters. The 1st chapter deals with "General aspects" and consists of two contributions. T. Heger discusses the process of invasion - a rather complex phenomenon influenced by several species attributes as well as characteristics of the recipient communities. As a possible research approach she suggests a "staircase" model that splits the process into four stages and the arising problems are grouped within these steps, thus giving a basis for their systematic analysis and an easier handling of the whole processes. M. Williamson discusses the applicability of possible predictors regarding impacts of invasive plants. He gives a detailed analysis of the following: plants' previous success, propagule pressure, distribution range and climate. Although none of the factors have been shown to be predictive on their own, there were considerable differences in their applicability.

The 2nd chapter - comprising the highest number of contributions (18) - deals with case studies of various species ranging from annual herbs (e.g., *Papaver* spp.) to large sized trees (e.g., *Gleditsia triacanthos*), and from cold temperate areas to equatorial regions. Studies on spatio-temporal behavior (2), the comparison of native and invasive populations (3), the taxonomy of problematic species-groups (1), the phytosociological and structural characterization of stands dominated by aliens (4), the life-cycle and reproductive behavior (7) and the effect of land use on invasive species (1) are represented (number of relevant contributions are shown in brackets).

In Chapter 3, the fate of invasive plants in protected areas is discussed only by L. Balogh (Hungary) and J. B. Bennett (USA), although some contributions of other chapters have strong relationship to this approach (e.g., Kendle and Rose's paper about St. Helena island). The slight underrepresentation of studies on protected areas may simply reflect the general thought that aliens are less successful in undisturbed, native vegetation types. However, another explanation that researchers prefer economically more important (and more financed) projects like control of weeds in arable lands can also be valid.

In the 4th chapter, contributions are common in their geographically determined subjects. Within a certain region or habitat type the whole invasive species pool is evaluated. The only exception is a study of three clonal invaders in Bohemia (*Reynoutria japonica*, *R. sachalinensis* and *Rudbeckia laciniata*). From "evergreen" topics of invasion ecology research, urban ecosystems (Rome) and river corridors are discussed in this chapter. The present status of alien invasion in Poland received three contributions from which Tokarska-Guzik's work gives a useful overview of the sophisticated terminology of non-indigenous species from "Apophytes" to "Ergasio-phygophytes". The evaluation of ecological and morphological attributes of invasive species is also an important issue. A survey of alien plants in Italy considered geographic origin, life form, flowering time, pollination biology, fruit type, dispersal modes and habitat types. Though the results are interesting and obviously useful for fellow researchers, the application of some statistical tests could have further improved the value of the paper.

Studies on invasive plant management form the 5th chapter (five contributions). Two papers discuss *Reynoutria* species, which are particularly aggressive in Europe since introduced from Japan. In the first paper, treatments of cutting, digging and their combination with spraying were evaluated on stands near Prague, whereas in the second one a complete “action plan” is developed for South Wales.

Another public-based effort to eliminate *Lepidium latifolium*, an invasive dicot, is reported from the Lake Tahoe Basin (USA). Owing to a detailed mapping of infested sites, a community-based education program and an “Adopt-a-spot” campaign among local residents, 70% of the whitetop stands has been successfully treated to date. The last two contributions discuss possible operations that offer advantage to the native species thus enable them to outcompete the invasive aliens.

About the general appearance of the book: a somewhat larger font size of the abstracts would have been better and the same inconvenience occurs in certain figures where explanatory legends are printed in very small fonts. Otherwise, the editorial work complies with the standard, with an index of main taxa and a general subject index which help the readers.

In summary, this book is a beneficial reading for ecologists and other experts who meet the problem of plant invasion. For young scientists wanting to enter this exciting field the book offers a wealth of research goals, as well as methodological approaches useful in planning future research.

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D. J. Levey, W. R. Silva, and M. Galetti (eds.), 2002. **Seed Dispersal and Frugivory: Ecology, Evolution and Conservation**. xvi + 511 pp. CABI Publishing, Wallingford, UK. ISBN 0 85199 525 X (hardback). Price: GBP 75.00 / USD 140.00

Frugivory or - in a wider context - propagule dispersal by animals is inevitably one of the most varied and fascinating interaction between plants and animals. This phenomenon ranges from the case when a starling pecks a grape to the rather bizarre feeding habit of earthworms which swallow small seeds and defecate them in their warm casts thus playing an important role in soil seed

bank dynamics. Since frugivory shows a worldwide distribution range it has long attracted the attention of not only field ecologists but evolutionary biologists as well. The present book treats the subject from widely varying perspectives and provides an easily accessible portrait of this dynamically developing field of science. Practically, the book is the proceedings volume of the Third International Symposium on Frugivores and Seed Dispersal (held in São Pedro, Brasil) and is composed of 32 contributions (written by 76 authors). However, the structure of the book (contributions are arranged in 5 chapters), and the obvious forward looking attitude - most of the contributions contain a definite section discussing avenues for future research - make it more than a traditional proceedings volume.

The first chapter is about “Historical and Theoretical Perspectives”, and is formed by six contributions. Among interesting topics like “maintenance of tree diversity in tropical forests”, or “the role of vertebrates in the diversification of new world mistletoes”, we can learn about the role of extinct flightless birds in the dispersal of fleshy-fruited trees. In New Zealand, where half of the native avifauna have become extinct since humans arrived, it is known that several fleshy-fruited species in the island’s flora drop their fruits at maturity. Is it an adaptation to seed dispersal by flightless birds, or were these fruits once consumed by volant species and due to the loss of the selective frugivores they now fall to the ground uneaten?

In the second and the third chapters, “Strategies” are discussed from the “Plant” and “Animal” side (nine and four contributions, respectively). In accordance with plant strategies, traits that serve the mutualistic interaction with the attracted animals received attention from several aspects. However, the presence of secondary metabolites in concentrations that make the fruits toxic to vertebrates, is a phenomenon not easy to understand. Another hot spot in this field is about plant foraging for gaps or other microhabitats they need for successful regeneration. Does it work through attraction of specific dispersers, like ants, that reliably execute a directed seed dispersal to the desired regeneration niche? From the animal strategies, rodents’ behavior related to seed dispersal is continuously in the focus of researchers’ interest and it received three contributions in this book, too. Case studies about two monkeys (*Procolobus badius* and *Cercopithecus ascanius*) and the maned wolf (*Chrysocyon brachyurus*) highlight foraging behavior of relatively large bodied mammals with more reference to coevolution regarding monkeys and to dispersal patterns regarding the wolf. Apart from these, readers can learn about more curious, less known effects as well, like sublethal consumption of

seeds which may increase germination rates of hard-coated leguminous seeds, while not significantly reducing seedling survivorship.

In the fourth chapter, five contributions about “Consequences of Seed Dispersal” are gathered. One of the most studied phenomena in this respect is frugivore-generated seed shadow already demonstrated in the seed ecology literature for several plant species. In this book, we find a detailed analysis of the seed shadow of *Prunus mahaleb* in a synphysiognomically diverse habitat of south-eastern Spain. The authors handled the subject in an amazing diversity of methods from watching birds that visited *P. mahaleb* trees, to the analyses of DNA extracted from trees and dispersed seeds, thereby allowing identification of the maternal tree of each seed. Besides the significance of this work in the field of seed ecology, it also represents a considerable attempt to link landscape- and molecular level research. Further topics in this chapter are recruitment limitation as affected by seed dispersal, effect of gut treatment on seed germination, role of primates in seed dispersal and post dispersal seed fate.

The fifth chapter, formed by eight contributions, is dedicated to “Conservation, Biodiversity and Management”. Large-seeded terrestrial plants can only be distributed effectively by birds and mammals with relatively large body size. Since these vertebrates are the most threatened by both habitat fragmentation and hunting, their existence is also critical for the dependent plants. Not surprisingly, the majority of contributions in this chapter are dedicated to this mutualistic interaction, with most emphasis on tropical areas. Probably the most critical questions regarding frugivory arise in cultivated lands, especially in orchards and vineyards. The traditional defence through lethal control of any bird species is rather undesirable since the increasing acceptance of nature conservation priorities, and the picture is made more complex by the recognition that agricultural areas can be important

to avian conservation. A major challenge is therefore to find ways for agriculture and birds to coexist. Could we introduce effective non-lethal crop-protection methods? Are we able to control bird species selectively? In this chapter, readers can find answers to these questions based on contemporary ecological knowledge.

In conclusion, this book is a colourful and inspiring reading about the subject. The technical edition is at the highest standard, and a 17-page index (subjects and species pooled, with hierarchic entry word structure, in two columns) helps the readers’ orientation. Probably the only drawback is the recurrent discussion of certain aspects of frugivory by different authors. It is obviously a concomitant of the proceedings style, yet it is at a tolerable level. However, it facilitates (at least in the reviewer’s mind) to propose the edition of a textbook under the same or similar title with a reduced number of invited authors, and a more tight thematic scheme. I strongly believe that the edition of such a book would be beneficial for both ecologists and the Publisher. Since the subject is equally important for botanists and zoologists, university departments and research institutes engaged in both fields would make a good purchase by ordering this book for their library. Additionally, I recommend this book for lecturers of ecology, because seed dispersal and frugivory are both important and spectacular topics in which ecological principles and rules are plastically manifested, attracting the students’ interest to the science of ecology.

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