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BOOK REVIEW

Mutualistic Networks, J. Bascompte, P. Jordano. Princeton University Press, Princeton (2014). 206 + xiv pages, Price: €33.50, ISBN: 978-0-691-13126-9 (hard cover) or 978-1-400-84872-0 (ePUB)

"Mutualistic networks" is a concise (136 pages plus appendices) summary of decades of experience with a very interesting ecological research topic by two of the leading experts in the field. It presents, in essentially five chapters, an introduction to networks, the specific structures of mutualistic networks, an evolutionary and phylogenetic perspective and two chapters on modelling of networks. These chapters are supplemented with seven appendices (on technical details of measures of network structure and how to evaluate them).

In research areas with rapid development, such as mutualistic networks, it is always difficult to present a book-long outline of the field and its frontiers, as by the time of publication chances are high that some material is already obsolete. Bascompte and Jordano are aware of this problem and present a descriptive overview of both history and recent findings, rather than critically examining all the ideas that have been proposed over the last few decades. While this gives the book a higher life expectancy, it also reduces its usefulness as a review of the state-of-the-art. For example, the authors highlight in several places the importance of sampling intensity and conversion of quantitative information into binary data on any of the network patterns reported. Indeed, they devote an appendix (F) to null models trying to correct for artefacts. But they present raw results with the same gusto as corrected results. They do so because the chronology of the research in the field covers the range from binary to quantitative data and from reporting patterns at face-value to "null modelling" them. While I would have preferred to clearly label the "old" patterns as "not tested with current best practice", the authors seem to give all studies similar weight. As a result, the book defines paradigms of mutualistic network analysis, some of which are outdated or plainly wrong. Nestedness, a measure of consistency of interactions with attractive to less attractive partners, may serve as an example because it is so prominent in this book. Early studies in highly cited journals got away with reporting that networks were nested and claiming ecological significance of this result, but current studies consistently show that networks are *less* nested than expected and specify *how* nestedness may (or may not) play out ecologically. Quoting the authors, earlier findings "could be an artifact of mapping variable interactions into a one-or-nothing scheme" (p. 54). I could not identify from the information presented whether nestedness is merely a convenient measure to compute or whether it has a clearly interpretable ecological relevance (from other papers I would lean towards "neither").

As a consequence of a description of the field, rather than a critical review, the presentation of some results are contradicted a few sentences, paragraphs or pages later. For example, the authors first claim that invasive species lead to "mutualism disruptions" (p. 124) to then write, only seven lines later, that "invasive species become well integrated". Or they write (p. 61) that nestedness values are similar across networks, only to contradict this information on page 54 and in Appendix C by stating that such values are incomparable because they are so strongly affected by connectance and size. Also, the definition of "species strength" on page 24 differs from the one on page 58 (which is the same as in Appendix A). The reason is not that the authors are confused but that both definitions are being used in practice. Who will be confused is the reader.

The authors discuss consequences of network structure for ecological processes and population stability in several places. Each time, links between species are seen as fixed and static, despite showing (in chapter 3) that these patterns emerge from evolutionary dynamics and are variable in time (chapter 5). How can then simulations of link removal (chapter 6, e.g. simulating climate change) or effects of perturbation on populations be in any way plausible? Would not pollinators shift to other plant species (since monolecty is virtually absent among pollinators)? Would epiphytes not germinate on the branches of tree species not driven to extinction by commercial logging? The dynamic models of chapters 5 and 6 are almost exclusively built around dynamic populations with static preferences, which does not make much sense to me, given the information provided in the nice outline of evolutionary build-up of networks in chapter 4.

Finally, the book addresses the very important question of why mutualistic network structure matters ecologically (chapter 6, "Consequences of network structure"). While an excellently written chapter, it contains only two references to actual data on network structure consequences (page 123), which contradict model expectations. All other material is based solely on models or simulations. That is the state of knowledge, and it cannot be blamed on the authors, but I

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detect an unbalance between claims and evidence throughout the book, which is particularly severe in this modelling chapter.

Overall, “Mutualistic Networks” is a book that presents a highly dynamic field in its entire breadth and historic development. A reader looking for practical guidance may not profit directly from it, but anyone interested in a passionate layout of a multifaceted and ecologically exciting research area will want to read it.

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