

## A review of Szulkin, M., J. Munshi-South, and A. Charmantier, eds. 2020. *Urban Evolutionary Biology*. Oxford University Press, Oxford, 303 pp. ISBN 978-0-19-883685-8

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In this Anthropocene epoch, where every single ecosystem on Earth is heavily shaped, both in space and time, by human deeds, natural landscapes are being rapidly replaced by urbanization. Henceforth, a new urban biome has arisen displaying certain unique properties, making cities around the globe a perfect place to investigate “natural” processes like ecology, evolution, adaptation, and biodiversity, away from their more natural forested counterparts. Interestingly, despite conurbations, or extended urban habitats, being thought of as adversaries of Mother Nature, organisms in urban environments are learning to adapt and survive, making them novel sources for evolutionary variation. Regrettably, despite advancements in methods to answer questions in ecology and evolutionary biology, there is a lack of knowledge about how urbanization influences evolution and its processes in an urban milieu. There is a dire need to understand issues such as the operational repercussions of urbanization, and the roles of evolutionary transformation in urban community dynamics.

This book, with little doubt, appears to be an effort to garner the attention of evolutionary biologists, ecologists, and conservation biologists worldwide in studying evolution and understanding its impacts on an urbanizing world. The book comprises 16, well-knit chapters encompassing a range of scientists contributing to our expanding knowledge of urban

evolutionary biology. The book elegantly progresses from topics (chapters) such as quantifying urbanization, parallelism in cities, landscape genetics involving gene flows and movements, adaptation genomics and impacts due to urban heat islands (UHI's), benefits of mutualisms in cities, the adeptness of plants in cities with unique geometries and life histories, responses of aquatic organisms to urbanization, feedback loops of meta-communities driving evolution in townships, terrestrial locomotive adaptations of animals in urban environments, pollutants and urban evolutionary physiology, outcomes of urbanization on sexually selected systems, the role of cognition to understand urban evolutionary fitness, and then culminating with a discussion chapter on cities driving human evolution (evolutionary medicine to be precise) and the various socioeconomic drivers impacting human health. These chapters are a treasure trove for those looking for abundant literature, review studies, and methodologies on the aforementioned topics.

The book is commendable for compiling an entire volume that contributes to augmenting our current knowledge on the evolutionary biology of wild populations living in cities pointed out by Blumstein (2020) in his book review. The readers will observe a range of model organisms (animals, plants and aquatic life forms) and their dynamics in conurbations.

However, we would like to emphasize that a few examples of microbiomes would have showcased how different organisms, and their microbiota are being studied and adapting to urban systems which somehow Blumstein (2020) failed to notice in his review. Inclusion of microbiomes would have enhanced the book's coverage, providing a more comprehensive view of how different life forms adapt to urban environments. Similarly, a chapter or two on how to translate the knowledge of evolutionary biology into "actions", amalgamating different disciplines such as urban planning, policy-making, and civil /architectural engineering would have encouraged readers to appreciate the importance of the trans-disciplinary nature and implementation of the topics discussed in the book. Our review thus suggests (rather than criticizing) the inclusion of chapters focusing on translating evolutionary biology knowledge into actionable strategies for urban planning and policy-making particularly focusing the Middle East/Asian regions where much work needs to be accomplished. Also missing, is a small introduction to the history of systematic urban evolutionary biology research and its traditions which would have augmented the comprehensive nature of the book.

Despite these minor shortfalls of this thought-provoking book, we have no hesitation in recommending this most-readable book. This book is a must for those who are interested in asking questions about adaptations occurring at a rapid pace and how plants and animals within cities could be coming up with unusual ways of acclimatizing to human-molded environments. This book is essential for both Middle East/Asian undergraduate and graduate students who could identify a myriad of topics for their future projects and dissertations, and it is equally endorsable to academics, conservation managers, and urban planners/decision makers looking for questions related to patterns and processes in urban evolutionary biology.

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## Author contributions

Shalini Tudu is the first author of the book review and was responsible for the initial drafting of the manuscript and making modifications as needed. Amith S. J. helped integrate and improve the review's content. Chetan Nag K S performed critical work in shaping the manuscript, ensuring its accuracy, professionalism, and scientific rigor through thorough correction and proofreading. All authors have read and approved the final version of the review.

## Conflict of interest

The authors declare that there are no conflicting issues related to this book review.

## Reference

- Blumstein, D. T. (2020). The respect it deserves: Book review of Szulkin, M., J. Munshi-South, and A. Charmantier, eds. 2020. *Urban Evolutionary Biology*. Oxford University Press, Oxford, 303 pp. *Evolution*, 74 (12): 2748–2751. <https://doi.org/10.1111/evo.14117>