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0521642949 - The Geometry of Ecological Interactions: Simplifying Spatial Complexity

Edited by Ulf Dieckmann, Richard Law, and Johan A. J. Metz

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## **The Geometry of Ecological Interactions: Simplifying Spatial Complexity**

The concept of invasion fitness, defined as the initial per capita growth rate of a rare mutant in the environment set by the resident types, lies at the heart of adaptive dynamics theory. Current research seeks to provide techniques for determining measures of invasion fitness in different ecological settings. These measures are well established for populations without spatial structure. However, for spatially heterogeneous populations, the patterns that typically arise from short-range ecological interactions often decisively influence invasion fitness. This first volume of the Cambridge Studies in Adaptive Dynamics provides systematic introductions to the modern tools available for describing ecological and evolutionary change in spatially structured populations.

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## Cambridge Studies in Adaptive Dynamics

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The modern synthesis of the first half of the twentieth century reconciled Darwinian selection with Mendelian genetics. However, it failed to incorporate ecology and hence did not develop into a predictive theory of long-term evolution. It was only in the 1970s that evolutionary game theory allowed the consequences of frequency-dependent ecological interactions to be analyzed. Adaptive Dynamics extends evolutionary game theory by describing the dynamics of adaptive trait substitutions and by analyzing the evolutionary implications of complex ecological settings.

The *Cambridge Studies in Adaptive Dynamics* highlight these novel concepts and techniques for ecological and evolutionary research. The series is designed to help graduate students and researchers to use the new methods for their own studies. Volumes in the series provide coverage of both empirical observations and theoretical insights, offering natural points of departure for various groups of readers. If you would like to contribute a book to the series, please contact Cambridge University Press or the series editors.

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Edited by Ulf Dieckmann, Richard Law, and Johan A.J. Metz

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