

Population processes

Population dynamics in ecological space and time. O. E. Rhodes Jr, R. K. Chesser and M. H. Smith, eds. The University of Chicago Press, Chicago, London, 1996, 388 pp., US\$ 50.00 (hbk), 17.95 (pbk). ISBN 0-226-71058-0

This book is a collection of materials presented during a small symposium consisting of about 40 participants and concerning spatial and temporal aspects of population processes which was held in the Savannah River Ecology Laboratory in Aiken, South Carolina (USA), between 3rd and 7th May, 1993. According to the editors it is the first publication in a planned book series presenting results of scientific symposia which are periodically held in the Savannah River Ecology Laboratory and concern the most important problems of modern environmental biology.

The book is divided into four parts excluding the Introduction and the Synthesis. These parts are as follows: "Population models", (two chapters), "Population responses in space and time", (three chapters), "Genetic organization in space and time", (three chapters) and "Population perturbations in space and time", (two chapters). The first part presents two concepts concerning the influence of spatial and temporal diversity of the environment on the dynamics and structure of a population which are generally known to population ecologists but still widely discussed: the Metapopulation Theory (chapter 1, by I. Hanski) and the Source-sink Theory (chapter 2, by H. R. Pulliam). These two chapters and the concepts they present establish the area of consideration for all the subsequent parts of the book. This is due to the fact that models of different life strategies based on movement and survival probabilities (Part II), as well as models of gene flow and genetic structure of populations (Part III) and the environmental risk assessment (Part IV) are strongly based on these two concepts.

In order to thrive in a given environment organisms must be able to survive, grow and reproduce successfully. Therefore, the spatial and temporal distribution of suitable habitat patches can determine the distribution and dynamics of a given species. Part III presents and discusses different evolutionary mechanisms and life strategies designed to deal with spatial and temporal variation of resources. This part of the book, which presents issues from the area of evolutionary ecology, appears to be the most interesting one. It is composed of the following chapters: "Multistage life cycles" by H. M. Wilbur; "Overlapping generations: the storage effect and the maintenance of biotic diversity" by N. G. Hairston Jr *et al.* and "Sources of variation in migratory movements of animal populations: Statistical inference and a selective review of empirical results for birds" by J. D. Nichols.

Problems of evolutionary ecology are also discussed in the third part of the book. It is beyond any doubt that such environmental factors as the spatial structure of habitats and hence the size and distribution of inhabitable patches, their temporal variation, as well as pressure of predators, the amount, quality and accessibility of food resources which influence the numbers and distribution of organisms have an indirect influence on spatial patterns of genetic organisation, rates of gene flow and transmission of genes from one generation to another. These issues are discussed in subsequent chapters of the third part of the book: "Consequences of dispersal in plants" by J. L. Hamrick and J. D. Nason; "Gene conservation" by R. K. Chesser *et al.*; "Spatial and temporal aspects of bacterial population genetics" by J. V. McArthur.

The fourth and last part of the book is devoted to practical implications resulting from the existence of spatial and temporal variation of populations. R. J. O'Connor presents a very interesting discussion concerning ecological effects of environmental pollution ("Toward the incorporation of spatiotemporal dynamics into ecotoxicology") while L. D. Harris *et al.* consider the ecological basis of activities aimed at the preservation of biodiversity ("Landscape processes and their significance to biodiversity conservation").

For many years ecologists did not pay much attention to the influence of spatial diversity on the structure and dynamics of populations and concentrated their studies mostly on their variation in time. The spatial diversity and variation of environments is currently perceived as one of main factors influencing animal and plant populations and it is discussed in almost all articles concerning population ecology, even when there is no need for it. It makes ecologists tired of constant reading of hundreds of papers devoted to the same subject that in fact don't introduce any new concepts to our knowledge of the issue. Therefore it is increasingly difficult to prepare an article that would be worth reading. It seems that the authors and editors of this book managed to achieve this aim. It is the compactness and the synthetic approach that make it so valuable. Thanks to it the reader gets a picture of the current state of our knowledge regarding the role of spatial and temporal variation of the environment in the shaping of the structure and dynamics of a population. However, the most important quality of the book is the fact that it shows areas of future research in the field.

Finally, it is worth mentioning a certain fault of the presented book. In the group of 18 authors there is only one from outside the USA, which is the excellent Finish ecologist Ilkka Hanski from Helsinki University. Some other well known and appreciated European ecologists that deal with issues presented in the book, for example some scientists from Scandinavia or Holland, are not amongst the authors. As a result the book does not give a full picture of the area and instead it presents only the views of a group of American ecologists. Nevertheless, I would recommend this book as good reading matter for students and professionals in population ecology as well as nature protection experts who would like to find a scientific basis in it for their practical activities.

Michał KOZAKIEWICZ, Department of Ecology, Warsaw University, Krakowskie Przedmieście 26/28, 00-927 Warszawa, Poland

BIAŁOWIEŻA ● ZAKŁAD BADAŃ SSAKÓW PAN ● POLAND

Nakład 650 + 50 egz. Obj. ark. wyd. 10,35 Obj. ark. druk. 7,0
Podpisano do druku w marcu 1997. Druk ukończono w marcu 1997.

Skład, łamanie, diapozytywy: Zakład Badań Ssaków PAN, Białowieża
Druk: Białostockie Zakłady Graficzne w Białymstoku.