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Abstract

Spatial Pattern Analysis in Plant Ecology

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The predictability of the physical arrangement of plants, at whatever scale it is viewed, is referred to as their spatial pattern. Spatial pattern is a crucial aspect of vegetation which has important implications not only for the plants themselves, but also for other organisms which interact with plants, such as herbivores and pollinators, or those animals for which plants provide a habitat. This book describes and evaluates methods for detecting and quantifying a variety of characteristics of spatial pattern. As well as discussing the concepts on which these techniques are based, examples from real field studies and worked examples are included, which, together with numerous line figures, help guide the reader through the text. The result is a book that will be of value to graduate students and research workers in the fields of vegetation science, conservation biology and applied ecology.

[methodology: analysis, statistics](#)

[phytosociology](#)

Notes

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Tartalom:

Preface

## 1. Concepts of spatial pattern

Introduction

Pattern and process

Causes of spatial pattern and its development

Concepts of spatial pattern

Concluding remarks

## 2. Sampling

Introduction

Sampling for pattern in a fixed frame of reference

Sampling for pattern relative to other plants

Location of sampling

Concluding remarks

## 3. Basic methods for one dimension and one species

Introduction

Data

Blocked quadrat variance

Local quadrat variances

Paired quadrat variances

New local variance

Combined analysis

Semivariogram and fractal dimension

Spectral analysis

Other methods

Concluding remarks

## 4. Spatial pattern of two species

Introduction

At most one species per point

Several species per point

Blocked quadrat covariance (BQC)

Paired quadrat covariance (PQC) and conditional probability

Two- and three-term local quadrat covariance (TTLQC and 3TLQC)

Comparison of methods

Extensions of covariance analysis

Other approaches

Relative pattern: species association

Concluding remarks

## 5. Multispecies pattern

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Semivariogram and fractal dimension

Methods based on correspondence analysis

Euclidean distance

Comments

Spectral analysis

Other field results

Species associations

Concluding remarks

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Blocked quadrat variance

Spatial autocorrelation and paired quadrat variance

Two-dimensional spectral analysis

Two-dimensional local quadrat variances

Four-term local quadrat variance

Random paired quadrat frequency

Variogram

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Paired quadrat covariance (PQC)

Four-term local quadrat covariance

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Cross-variogram

Landscape metrics

Other methods

Concluding remarks

## 7. Point patterns

Introduction

Univariate point patterns

Anisotropy

Bivariate point patterns

Multispecies point pattern and quantitative attributes

Concluding remarks

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Introduction

Continuous presence/absence data

Quadrats: presence/absence data

Density data

Concluding remarks  
9. Conclusions and future directions  
Summary of recommendations  
What next?  
Three dimensions  
Relation to spatial structure of physical factors  
Obvious extensions  
Temporal aspects of spatial pattern analysis  
Wavelets  
Questions and hypotheses  
Concluding remarks  
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List of plant species  
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