Biodiversity Committee, Chinese Academy of Sciences (BC-CAS),
Institute of Botany, Chinese Academy of Sciences (IB-CAS)
and Chinese Forest Biodiversity Monitoring Network

Pierre Legendre

Professor, Département de sciences biologiques, Université de Montréal
C.P. 6128, succursale Centre-ville, Montréal, QC, Canada H3C 3J7

E-mail: Pierre.Legendre@umontreal.ca
WWWeb page for free software: http://www.bio.umontreal.ca/legendre/
WWWeb pages for this course : http://biol09.biol.umontreal.ca/Beijing09/

Workshop on

Recent Advances in Spatial Ecology: Theory and Practice

Venue: Institute of Botany, Chinese Academy of Sciences, Beijing

October 1-6, 2009

Day 1

1. Introduction to data analysis.
2. Ordination in reduced space: principal component analysis (PCA), principal coordinate analysis (PCoA), correspondence analysis (CA). Treatment of rare species in CA.
3. Transformation of species abundance data tables prior to linear analyses.

Day 2

4. Measures of similarity and distance, especially for community composition data.
5. Multiple regression. R-square and adjusted R-square.
6. Partial regression and variation partitioning.

Day 3

7. Statistical testing by permutation.
8. Canonical redundancy analysis (RDA) and canonical correspondence analysis (CCA).
9. Multivariate analysis of variance by canonical analysis.

Day 4, morning

10. Forward selection of environmental variables in RDA.
11. Spatial modelling: Origin of spatial structures in ecosystems.
12. Multi-scale modelling of the spatial structure of ecological communities by spatial eigenfunctions : PCNM, MEM, AEM. Examples.

Day 5, morning

13. Test of space-time interaction in repeated surveys.
14. Spatial structure functions: correlograms, variograms.
15. Controlling for spatial structures in tests of species-environment relationships.
16. Sampling designs for analysis of spatial patterns

Day 6, morning

17. Mantel test.
18. Multivariate Mantel correlogram.
19. Cartographic interpolation, kriging.
20. Spatial variation partitioning: canonical analysis or Mantel test?

⇒ Afternoons: Practicals about these topics using the R language

• Introduction to the R statistical language (file: Introduction_to_R.pdf)

• Practicals in the R language: Basic matrix operations (file: Basic_matrix_operations.pdf)

• Practicals using the R statistical language (file: Practicals_in_R.pdf)