



APPLIED METHODS IN COMMUNITY ECOLOGY AND FUNCTIONAL ECOLOGY

Lecturers: Paulo A. V. Borges & François Rigal (Azorean Biodiversity Group, cE3c)

Calendar: February 8-12 2016

Duration: 36 hours

Schedule: 9h00-13h00 and 14h30-17h30 Monday to Thursday; 9h00-13h00 and 14h30-18h30 Friday

Objectives: This is a mostly practical course offering an overview on different community ecology and macroecological methods and software. These will include all steps of a research project, from the optimal sampling of communities to process inference from large-scale patterns of taxon, phylogenetic and functional diversity. Specific topics will be: (1) alpha, beta and gamma diversity; (2) sampling biodiversity in all dimensions; (3) estimating diversity from incomplete sampling; (4) partitioning taxonomic beta diversity; (5) species-abundance distributions; (6) species-area relationships, (7) phylogenetic and functional diversity (alpha, beta and gamma) and (8) community-assembly rules. Finally, students will be asked to present own data and case studies.

General Plan:

1. Partitioning diversity into independent alpha, beta and gamma components - basic concepts and software (Species Diversity & Richness IV).
2. Strategies for sampling biodiversity in all dimensions with standardized protocols – description of projects, sampling methods and database construction (projects BALA, COBRA, NETBIOME)
3. Estimating diversity from incomplete sampling - algorithms and applications (EstimateS, R, BAT, SDR).
4. Partitioning beta diversity - multiplicative vs. additive measures of beta diversity and replacement vs richness differences components. Applications in PARTITION and R.
5. Rarity and Species Abundance Distribution Models (SADs) with new applications in R.

6. The abundance-distribution relationship - The unitary model of rarity (Taylor's power law and abundance-occupancy models)
7. Species-area relationships and Island Biogeography (Practical applications).
8. Conceptual bases of functional and phylogenetic approaches in community ecology.
9. Computing functional and phylogenetic diversity (overview of the different indices and different R packages available and introduction to null models)
10. Student's case studies.

This course can have a recognition of 6 ECTs for FCUL PhD students enrolling in it as part of their first doctoral year. For FCUL PhD students only requiring 5 ECTs recognized in their specific PhD programmes the last 6 hours of the course are not mandatory and the certificate will be on 'Topics in Applied methods in Biogeography'.

Location: Departamento de Biologia Animal (FCUL) or Universidade dos Açores (Angra do Heroísmo) depending of the edition. In 2016 the course will be held in Lisbon.

Nº (min, max) students: 10 –20

Minimum formation: "Licenciatura" (bachelor) in Biology, Geography or related areas; (very) basic knowledge of R is required.

Directed to: PhD or MSc students in Ecology, Geography or related areas, and postdocs and other professionals working in related topics.

Fee: free for 1st year PhD students in the Doctoral programme in Biology (FCUL), Biodiversity, Genetics and Evolution (UL; UP) and Biology and Ecology of Global Changes (UL, UA); 20 € for PhD students from institutions of the PEERS network (cE3c, CFE); 100 € for FCUL Master students and unemployed; 150 € for BTI, BI and other PhD students; 200 € for Professional and postdocs.

Deadline for applications: December 17th, 2015

Candidates should send a short CV and motivation letter explaining why they are interested in the course, including a brief description of their research projects. Send all information and requests to Paulo A. V. Borges (pborges@uac.pt).