



## Biodiversity and Plant Evolution

Organized by: Centro de Biologia Ambiental (<http://cba.fc.ul.pt/>) and Museu Nacional de História Natural (<http://www.mnhn.ul.pt/>)

**Teachers:** Manuela Sim-Sim and Helena Cotrim (coordinators), Maria Amélia Martins Loução, Adelaide Clemente, Ana Isabel Correia, Cecília Sérgio, César Garcia (researchers in Museu Nacional de História Natural-CBA).

**Calendar:** 16-24 January 2012

**Duration:** 30 hours (TP) of lectures and practical sessions

**Schedule:** 4-5 hours per day: from 14h-18/19h, everyday

### Objectives

On completion of the course, the students shall have acquired the following knowledge and understanding:

- Describe the main evolutionary acquisitions on groups of the plant kingdom and its adaptative significance.
- Comprehend the modern plant phylogeny and its sources of information.
- Explain the underlying evolutionary mechanisms of diversity and speciation in the plant kingdom.
- Describe the variety of pollination syndromes, reproductive systems and population structures present in the plant kingdom, and explain the mechanisms underlying this diversity.
- Explain and critically analyse how the genetic diversity and evolutionary potential of plant populations are influenced by phenomena like phenotypic plasticity, seed banks, clonality, hybridization, polyploidy and postglacial colonization history.
- Formulate hypotheses and propose methods when studying evolutionary phenomena in wild plant species.

### General Plan

1. Evolutionary acquisitions in land plants (Embryophytes).6 h
2. Phylogeny of land plants. Contemporary sources of information for land plants systematic.3 h
3. Evolutionary processes and plant population structures. Phenotypic plasticity and adaptation. Ecotypes and clines.3 h
4. Postglacial colonization history of plants in Europe and Atlantic islands. Genetic and biogeographic consequences. Phylogeography.3 h
5. Allopatric and sympatric speciation in the plant kingdom. Speciation through hybridization and chromosomal changes. Species concepts.5 h
6. Pollination and reproductive biology. Plant mating systems. Reproductive costs and strategies in the plant kingdom. Selective processes associated with fertilization and seed development.4 h

7. Population dynamics and demography of plant populations. Population models. Clonality, seed banks and life histories. 2 h

8. Biodiversity and conservation biology of plants. Consequences of differentiation, hybridization and different species concepts for the conservation value and long-term maintenance of plant diversity. The role of Natural History Museums in biodiversity conservation. In situ and ex situ conservation. Convention on Biological Diversity. 4 h

**Location:** Museu Nacional de História Natural

**N° (min, max) students:** 4-16

**Minimum background:** 'Licenciatura' (bachelor) degree in Biology or related areas

**Fee:** free for 1<sup>st</sup> year PhD students in the Doctoral programme in Biology (UL), Biodiversity, Genetics and Evolution (UL, UP) or Biology and Ecology of Global Changes (UL, UA); 150 euros for FCUL master students; 200 euros for research technicians and other PhD students; 250 euros for others.

**Deadline for applications:** December 2, 2011

Candidates should send a short CV and a motivation letter to Helena Cotrim at the following email address: [hmcotrim@fc.ul.pt](mailto:hmcotrim@fc.ul.pt)

