

## Paleobotànica

2014/2015

Code: 43138

ECTS Credits: 6

Degree	Type	Year	Semester
4314104 Paleontologia	OT	0	2

### Contact

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### Use of languages

Principal working language: anglès (eng)

Some groups entirely in English: No

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

### Prerequisites

Basic knowledge on biology and/or geology

### Objectives and Contextualisation

Knowing the main steps of vascular plant evolution from the fossil record

Applying the fossil record of plants in the analysis of taphonomy, paleoecology and paleoclimatology

Knowing the interactions between plants and insects in the fossil record and its interest for paleoecology

### Skills

- Analyse data using the appropriate tools in the field of palaeontology.
- Apply the theories, paradigms and concepts of biology and ecology to analyse the biological aspects of organisms and ecosystems of the past.
- Apply the theories, paradigms and concepts of geology to achieve an appropriate holistic vision of the Earth's history
- Design and conduct research in the field of palaeontology and disseminate the results.
- Develop a capacity for criticism and self-criticism in the field of palaeontology:
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Obtain and synthesise information from the scientific literature (library, databases, online journals or reliable websites) in the field of palaeontology.
- Recognise and use appropriately the fossil record to solve specific problems in the different areas of palaeontology.
- Show mastery of the various methodologies for studying the different fossil groups, gathering and integrating field and laboratory data.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use the different techniques for studying, conserving and disseminating the fossil record.

### Learning outcomes

1. Analyse data using the appropriate tools in the field of palaeontology.
2. Apply information on the plant fossil record to solve palaeoenvironmental (palaeoclimatic and palaeoecological) problems.
3. Apply the appropriate study methodology for each type of plant remains.
4. Carry out a climate analysis on the basis of a Quaternary pollen diagram.
5. Develop a capacity for criticism and self-criticism in the field of palaeontology:
6. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
7. Integrate plant and animal fossil remains within a single palaeontological analysis.
8. Know the interactions between plants and insects in the fossil record.
9. Know the main groups of fossil vascular plants on the basis of their dispersed organs (familiarity with the use of parataxonomy).
10. Obtain and synthesise information from the scientific literature (library, databases, online journals or reliable websites) in the field of palaeontology.
11. Propose hypotheses on a plant's habitat on the basis of sedimentological and taphonomic analysis.
12. Relate a plant association to its chronostratigraphic context.
13. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
14. Write a palaeontological report on the plant fossil record and its palaeoenvironmental implications.

## **Content**

### 1. The origin of Embryophytes

Algal ancestors of Embryophytes. The colonization of the terrestrial environment (2 h teaching).

### 2. Origin and evolution of early vascular plants

Origin of the Tracheophytes and the vegetation of the Paleophytic (2 h teaching).

The vegetation of the Upper Carboniferous (2 h teaching).

The wetland vegetation of the Upper Carboniferous (4 h practicum).

Exercise on the paleoecology of Carboniferous plants (5 h).

### 3. Origin and evolution of seed plants

The origin of the seed and the Mesophytic vegetation (2 h teaching).

Plant associations of the Mesophytic (2 h practicum).

### 4. Origin and evolution of Angiosperms

The origin of the flower and the early evolution of Angiosperms (2 h teaching).

Evolution of the Cenozoic vegetation in relation with the global climate change (2 h teaching).

The study of Cenozoic climate changes from the plant fossil record (4 h practicum)

Exercises about the interpretation of Quaternary palynological diagrams (10 h)

### 5. The amber and the plant-insects interactions

Interactions between insects and plants (2 h teaching).

Amber in the fossil record (2 h teaching).

Fossil record of the interactions between plants and insects (2 h practicum).

## 6. The vegetation and insects in the Miocene basin of Cerdanya

Field practicum in the late Miocene of la Cerdanya, Pyrenees (11.25 h field work teaching, 20.75 h. supervised field work, 20 h autonomous work).

### Methodology

The course is organized in classroom teaching combined with laboratory practicum. This practicum focuses primarily on character recognition of the different parataxa and its application in biostratigraphy, paleoclimatology, paleoecology, and evolution. Some exercises will be proposed during the practicum. During the 1.5 days field work the methodology to obtain data on plants and fossil insects in the field will be shown, a preliminary determination will be undertaken and a paleoenvironmental interpretation will be performed. The result is reflected in a written report.

### Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Ancestors of Embryophytes and their origin (talk)	2	0.08	2, 9
Field practicum on plant and insect taphonomy and palaeoecology in the Miocene of the Cerdanya basin	11.25	0.45	2, 8, 7, 11
Origin and evolution of early vascular plants	8	0.32	2, 9, 13
Origin and evolution of flowering plants	6	0.24	2, 9, 4
Origin and evolution of seed plants	6	0.24	9, 10, 12
The amber and the insect-plant interactions	6	0.24	8, 7
Type: Supervised			
Analysis of Quaternary palinological diagrams	5	0.2	4
Applying plant assemblages to the resolution of chronostratigraphic and paleoecological questions	5	0.2	1, 2, 9, 12, 13
Plant paleoecology from carboniferous plants	5	0.2	2, 3, 9, 6, 11
Writing a report based on the results obtained during the field practicum and the specialised literature	20.75	0.83	14, 10
Type: Autonomous			
Autonomous study of the matters taught in order to be able to resolve the exercises	75	3	1, 2, 9, 4, 6, 10, 11, 12, 13

### Evaluation

The exercises and the field work report will be the main items evaluated. The active participation of the student in the classroom, in the laboratory and during the field work will be also taken into account.

## Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Active participation in the classroom and during the laboratory and field work practica	10%	0	0	5, 6, 13
Exercises	40%	0	0	2, 9, 11, 12, 13
Field work report	50%	0	0	1, 14, 10