

Andrew Whitham CASP Fieldwork Award - 2021-22 Winner

Applicant: Glavendyck Julia

Project title: Field-based sedimentology and stratigraphy of Early Cretaceous strata in Portugal

Award: £2,100

Scientific question and rationale: The pre-Aptian record of early angiosperm pollen is scarce, mostly fragmentary and based on findings from strata lacking precise stratigraphic assignment. We investigate the basic environmental and stratigraphic framework as a precondition to decipher the very early phase of flowering plant evolution using palynology. Well-exposed sedimentary successions of the Lusitanian Basin (Portugal) will be studied with a combined bio- and chemostratigraphic approach.

Specific objectives and deliverables:

- (1) Establishing a bio- and chemostratigraphic framework based on macrofossils, calcareous nannoplankton, $^{87}\text{Sr}/^{86}\text{Sr}$, $\delta^{13}\text{C}$
- (2) Developing a facies-based depositional model for the mixed carbonate-siliciclastic near-shore successions
- (3) Investigating trends in palynofacies and comparing it with sedimentology to understand potential taphonomic biases

Proposed work plan:

field campaign in three localities in the Lusitanian Basin (Portugal) (summer 2021?; subject to Covid-19) – 5 weeks

proximal-distal transect based on (1) Ericeira Nord section; (2) Cap Espichel section; (3) Cascais section

- Detailed outcrop documentation and bed-by-bed logging of strata,
- Documentation of lithology, sedimentary structures, biofacies, ichnofossils and discontinuity surfaces
- Drawing of sedimentological logs (scale 1:50)
- Intrabasinal correlation
- High resolution sampling (for facies characterization, bio- and chemostratigraphy, palynology)

In the following 18 months:

- Processing and counting samples for palynofacies analysis incl. statistical analysis
- Processing and analysing samples for strontium and carbon isotope stratigraphy
- Establishment of a stratigraphic framework
- Integration of results from all sections for a facies-based depositional model for the near-shore succession in the Lusitanian Basin
- Final report for CASP

Proposed expenditure, including details of any other sources of funding: This proposed field-work represents a flanking activity for an ongoing project funded by the German Research Council (DFG, HE 4467/9-1) entitled 'Deciphering the very early phase of angiosperm evolution using palynology' with focus on the terrestrial pollen record. Here **we ask for support to conduct sedimentological and stratigraphic field work in the Lusitanian Basin**, which will provide crucial information to better understand the paleoenvironmental background and potential taphonomic bias of the early angiosperm pollen record.

Expenditure: 300 € flight; Hannover/ Frankfurt – Lisbon – Hannover/Frankfurt
35x 60€ = 2100€ daily allowance + accommodation

= TOTAL 2400€