

Mark James Studentship (Geography Department, Birkbeck)

Project Title: Disentangling the drivers of Insect Armageddon: determining the impact of anthropogenic disturbances on midge diversity in the UK

Principal Supervisor: Dr Stefan Engels (s.engels@bbk.ac.uk)

Co-Supervisors: Prof. Helen Bennion (UCL); Dr. Celia Martin-Puertas (RHUL)

Project description

Anthropogenically driven environmental change is leading to dramatic changes in the structure and composition of biological communities across the world, and has triggered a decline in global biodiversity. Freshwater ecosystems have been especially vulnerable to these disturbances as anthropogenic impacts on lakes and rivers have already led to severe declines in the abundance of many freshwater species, with the insect fauna being particularly affected – often referred to as "Insect Armageddon". As insects play a key role within the aquatic food web, any changes to the insect community will have knock on effects across all trophic levels, ultimately impacting the ecosystem services the lake provides.

Due to the relatively short time-window of data availability, it has been impossible to disentangle the effects of the myriad of human drivers that are currently simultaneously impacting our freshwater ecosystems. The main aim of this PhD project is to use palaeoecological records to examine the effects of individual human drivers on the insect fauna of shallow lake ecosystems. It will particularly focus on changes in subfossil chironomid remains (non-biting midges) as they provide an excellent opportunity to study shifts in a lake's insect fauna (Engels et al. 2020).

Approach:

You will retrieve and date sediment cores from a set of shallow lakes in the UK and determine how the chironomid diversity of these lakes changed as a result of a range of anthropogenic impacts, including mining, agricultural intensification and tourism.

Training:

The studentship is for three years. During this time you will receive advanced practical training in the generation of highly resolved palaeoecological records, including sedimentological, chronological and palaeoecological techniques; the use of a range of biodiversity metrics; and the interpretation and presentation of scientific data in the context of (palaeo-) ecological research questions. You will gain experience working in different labs and research environments, and will have access to facilities such as dedicated labs for

chemical analysis, as well as to seminar series across three institutes within the University of London.

Candidate Requirements:

We invite applications from outstanding and highly motivated candidates who have an undergraduate or Master's degree in Quaternary Geology, Geography, Biology or another relevant discipline at merit or distinction level (with a minimum grade of 65% for their dissertation). Experience of field- and laboratory work would be advantageous.

Subject areas/keywords:

- Palaeoecology
- Biodiversity
- Freshwater ecology
- Chironomidae
- Pollution

Key References:

Dudgeon (2019) Multiple threats imperil freshwater biodiversity in the Anthropocene. *Current Biology* 29, R960-R967

Engels et al. (2020) Temperature change as a driver of spatial patterns and long-term trends in chironomid (Insecta: Diptera) diversity. *Global Change Biology* 26, 1155-1169

Van Klink et al. (2020) Meta-analysis reveals declines in terrestrial but increases in freshwater insect abundances. *Science* 368, 417-420.

Further information:

Further information about PhDs at Birkbeck is available from the [research section of the Birkbeck website](#).

Application forms and instructions on how to apply are available from the [Geography, Environment and Development Studies programme page](#).

The application will prompt you to confirm details of any scholarships or grants (for your proposed study at Birkbeck).

Please ensure that you respond with: 'Mark James Scholarship'. (Failing to do so means that your application may not be considered for the scholarship.)

Please also ensure that, in the section where you identify your potential supervisor, you add the name of the supervisors and the title of the project you are applying for.

1. Check that you meet the **entry requirements**, including English language requirements, as below:

If English is not your first language or you have not previously studied in English, our usual requirement is the equivalent of an International English Language Testing System (IELTS Academic Test) score of 7.0, with not less than 6.5 in each of the sub-tests.

Visit the International section of our website to find out more about our [English language entry requirements and relevant requirements by country](#).

2. We request the following **documents** from each applicant:
 - A recent CV
 - Transcripts of relevant studies and – where appropriate – a letter from your course coordinator predicting the expected degree result (for those who are currently enrolled in a Master's-level programme or equivalent);
 - A sample of writing such as your MA dissertation, or similar.
 - A supporting statement. In the case of a Mark James scholarship, you will be applying for a specific project, which means you are not expected to submit your own research proposal. Instead, please state clearly in your application which project you are applying for, and use the Supporting Statement in the application to explain what attracted you to the project and why you are a suitable candidate for this research.
3. References

Referees will be automatically prompted to upload their references when you submit your application.

Please note that all references must be uploaded by **18 April 2022**. We strongly encourage you to contact your referees in advance to ensure they are prepared to upload their reference following submission of your application.

Closing date for applications is: 11 April 2022.

If you have any questions, please contact the respective supervisor(s) of the project you wish to apply for.