



PhD studentship: Genomic analysis of dispersal and adaptation in porcini mushrooms.

With Prof Joe Hoffman (Bielefeld University, Germany) together with collaboration partners Prof. Bill Amos (Cambridge University), Dr. Kanchon Dasmahapatra (University of York, UK), Prof. Bryn Dentinger (University of Utah, USA), Prof. Thorunn Helgason (University of York, UK), Dr. Minou Nowrousian (Ruhr-Universität Bochum, Germany), Dr. Ulrike Damm (Senckenberg Museum of Natural History, Görlitz, Germany) and Dr. Fernando Martínez Peña (Agri-food Research and Technology Center of Aragon, Spain).

A great opportunity is available for a PhD student to work on the evolutionary genomics of porcini mushrooms. The position is available in Joe Hoffman's research group (www.thehoffmanlab.com) at the Department of Animal Behaviour at Bielefeld University and is fully funded for three years. It will combine fieldwork in Germany, the UK, France and Spain with lab-based bioinformatic analysis of next generation sequencing data.

The PhD project

Ectomycorrhizal fungi (EMF) are critical components of terrestrial ecosystems that play essential roles in nutrient recycling. Consequently, there is a pressing need to study their population dynamics and life histories so as to better understand how ecosystems function and persist. In particular, we need to learn how EMF disperse, colonise new habitats, adapt to their hosts and, in the longer term, speciate. This project will focus on the iconic edible mushroom, *Boletus edulis*, known variously as the penny bun, cèpe de Bordeaux, porcino or Steinpilz. It will exploit a large collection of *B. edulis* samples to deliver arguably the most comprehensive population genomic study of any wild fungus. Systematic repeated sampling of multiple woodland patches from Bielefeld (Germany) and Thetford Forest (UK) will be used to investigate fine-scale patterns of dispersal, population structure and adaptation to different tree hosts. Overall, this project will produce a detailed picture of how EMF populations become established, spread and evolve. Understanding these processes is essential for predicting ecosystem responses to climate change.

Applicant's profile

We seek a bright and highly motivated student who holds a good first degree and an M.Sc. or equivalent in a relevant topic (e.g. molecular ecology, fungal biology, population genomics, bioinformatics). The ideal candidate will have strong quantitative skills, including proficiency in working in R and writing custom scripts. Practical experience of working with next generation sequence data would be advantageous, but full training will be provided. The candidate should also be able to work both independently and as part of a multidisciplinary team. A high standard of spoken and written English is required.

The working environment

The PhD student will be based at the Department of Animal Behaviour at Bielefeld University, Germany (www.uni-bielefeld.de/biologie/vhf/index.html). The department is the oldest of its kind in Germany and currently hosts seven principal investigators, nine postdocs and 15 PhD students. It offers a stimulating, supportive and highly international environment as well as an excellent research infrastructure. The working language of the Department is English.

Bielefeld is a city of 325,000 inhabitants with an attractive historical centre and easy access to the Teutoburger Wald for hiking and other outdoor pursuits. It is an affordable and pleasant city to live in and is well connected to most major European cities.

The PhD student will be based at Bielefeld University but will have ample opportunities to interact with the international collaboration partners, who bring additional expertise in molecular ecology (Bill Amos), speciation genomics (Kanchon Dasmahapatra), fungal biology (Bryn Dentinger), plant-fungal interactions (Thorunn Helgason), fungal mating system evolution (Minou Nowrousian), fungal systematics (Ulrike Damm) and mycological conservation (Fernando Martínez Peña). The successful applicant will therefore benefit from an integrative, multidisciplinary training that will prepare her/him very well for a scientific career in molecular ecology / fungal biology / population genomics / conservation biology.

Remuneration

This generous PhD studentship is funded by the German Science Foundation (DFG) for a period of three years and includes health insurance. The pay scale is TVL E13 (65%). Funding will also be available for travel and for the student to attend workshops and conferences.

Application procedure

To apply for this position, please provide: (i) a letter of motivation including a maximum 2-page statement of your research interests, relevant skills and experience; (ii) a CV including publication list; (iii) names and contact details of two referees willing to write confidential letters of recommendation; and (iv) please also state where you saw the position advertised. All materials should be emailed **as a single PDF** to: joseph.hoffman@uni-bielefeld.de with 'PhD application' in the subject line.

The application deadline is **1st March 2022** and online interviews will take place shortly afterwards. The the position should start as soon as possible, although there is scope for flexibility depending on the timeframe of the most qualified applicant. For further information, please see www.thehoffmanlab.com or contact Joe Hoffman (joseph.hoffman@uni-bielefeld.de) with any informal inquiries.

Bielefeld University has received a number of awards for its achievements in the provision of equal opportunity and has been recognized as a family friendly university. The University welcomes applications from women. This is particularly true with regard both to academic and technical posts as well as positions in Information Technology and Trades and Craft. Applications are handled according to the provisions of the state equal opportunity statutes. Applications from suitably qualified handicapped and severely handicapped persons are explicitly encouraged.

Representative publications

Hoffman JI *et al.* (2020). Genetic analysis of *Boletus edulis* suggests that intra-specific competition may reduce local genetic diversity as a woodland ages. *Royal Society Open Science*, 7: 200419. Doi: 10.1098/rsos.200419.

Tremble K *et al.* (2020) Lost in translation: Population genomics and long-read sequencing reveals relaxation of concerted evolution of the ribosomal DNA cistron. *Molecular Phylogenetics and Evolution*, 148: 106804. Doi: 10.1016/j.ympev.2020.106804.

Parladé J *et al.* (2017) Effects of forest management and climatic variables on the mycelium dynamics and sporocarp production of the ectomycorrhizal fungus *Boletus edulis*. *Forest Ecology and Management*, 390: 73–79. Doi: 10.1016/j.foreco.2017.01.025.

For further relevant publications and downloadable PDFs, please see www.thehoffmanlab.com.