

Position for a PhD student

Biodiversity-Ecosystem functioning in a ciliate's world:
how inter-individual variation shapes ecosystem functions in the face of stress

Research Environment

UCL is a multidisciplinary university situated in Louvain-la-Neuve (French-speaking Southern part of Belgium). Its Earth & Life Institute regroups around 450 people performing research in various themes linked to earth and life sciences, including its Biodiversity section, a group of 7 teams, each led by a professor focusing their research on ecology, evolution and biodiversity.

The Quantitative Conservation Biology team (www.uclouvain.be/quant-cons-biol), led by Prof. Nicolas Schtickzelle, focuses on viability and dynamics of (meta)populations in a context of biodiversity conservation. Our research aims to study, quantitatively and on model systems, the effect of major perturbations on species viability; the two main research axes are based on natural butterfly metapopulations in the wild, and experimental microcosms of unicellular organism in the lab.

The project will be co-supervised by Prof. Frederik De Laender, University of Namur (French-speaking Southern part of Belgium), PI of the lab of environmental ecosystem ecology (www.eecology.eu). Frederik is currently supervising a team of 8 PhD students working on community and ecosystem ecology and ecotoxicology using models and microcosm approaches. A main research area this lab is active in is the relationship between biodiversity, ecosystem functioning, and environmental stress exerted by toxic chemicals.

Research summary

Despite the huge body of the research on the relationship between biodiversity and ecosystem functioning, we still do not have a clear understanding of the mechanisms underlying it. In particular, biodiversity is often equated with species richness, and the need to understand the effects of functional diversity on ecosystem functioning is pressing. Moreover, studying the inter-individual variation in functional traits will facilitate understanding the key processes behind biodiversity-ecosystem functioning relationships. We propose a PhD project focused on investigating how functional diversity measured at the individual level affects multiple ecosystem functions. In the second phase of the project we will ask how effects of several abiotic stressors (salt, pesticides) affect functional biodiversity, and thus ecosystem functioning. These questions will be addressed using a highly flexible microcosm laboratory system with a ciliate species, which in our lab is represented by 44 strains (genetic clones) differing in major functional traits, in particular mobility and morphology. We aim exploiting such diversity of functional traits to inspect their effect on several ecosystem functions, e.g. biomass, dissolved oxygen and productivity. The project also includes a strong modeling component. First, the effect of intraspecific functional diversity (i.e. inter-individual variability in trait attributes) on ecosystem functioning will be synthesized with analytically tractable models. Second, the effect of the selected stressors on these traits will be included.

More information about our past research using the *Tetrahymena* microcosms, or on the developed modeling techniques, can be found in our publications, available on request if you do not have online access to them.

Profile

- European (300 ECTS) MSc diploma in biology, bioengineering or a related field. Other diplomas might qualify provided they allow entering the PhD programme in the university that delivered it.
- Some research experience, and/or publications, in ecology-evolution-biodiversity are an asset.
- Experience with ecological modelling and/or microcosm experiments is an asset.
- Strong motivation and commitment to pursue a research to finish a PhD thesis in 4 yr.
- Autonomous but willing and able to play as an interactive team player.
- Good knowledge of scientific English, written and spoken.
- Knowledge of French is not necessary (scientific activities are performed in English) but may help for administrative aspects.

We offer

- 2 yr of salary (tax-free PhD grant). A PhD thesis is normally completed in 4 yr in Belgium. Funding is secured for the first 2 yr, but the successful applicant is expected to apply to PhD grant calls to extend his/her grant, under the supervision of Prof. Nicolas Schtickzelle. Several options are available (e.g. FRIA and FNRS (www.fnrs.be) offer 1 call per yr, each), and our past record of success rate is high.
- A pleasant and stimulating working environment with a dynamic supervision team. The PhD thesis will be officially supervised by Prof. Nicolas Schtickzelle, is integrated in the framework of a postdoc project by Dr Viktoriia Radchuk, and will benefit from the collaboration of Prof. Frederik De Laender (University of Namur, <http://www.eecology.eu>) and optionally from researchers of the Moulis CNRS research station (<http://www.ecoex-moulis.cnrs.fr>).
- Some freedom to develop your own research direction within the project theme, interactively with the supervision team.
- Funding for research expenses and travel to attend conferences and/or perform training/research stays in our international collaboration network.
- Free public transport to and from the institute.

Application

To apply, please send to Prof. Nicolas Schtickzelle (Nicolas.schtickzelle@uclouvain.be):

- A motivation letter stating why performing a PhD thesis is part of your career plan, why this project meets your scientific interest, and why you believe you qualify for this position.
- A CV with details on previous research experience (including during your studies).
- The name and email address of 2 or 3 reference persons who can comment on your application to this position.

Applications will be reviewed from October 15th, 2015, until the position is filled.