

PhD in urban evolution of Lepidoptera

University of Bremen

Germany

Full Time

Posted

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I (Matthew Nielsen) am starting a new research group at the University of Bremen in Germany which will use insects to study evolutionary and plastic responses to global change. As part of this group, I seek to hire a PhD student for a project on urban evolution in butterflies.

Project description

The PhD student will participate in a project studying how seasonal plasticity of butterflies, specifically *Pieris napi*, is evolving in cities. Many insects and other organisms rely on photoperiod (daylength) as a cue for seasonal plasticity because photoperiod reliably indicates the time of year, which in turn predicts seasonal changes in the environment. For example, *P. napi* uses photoperiod as a cue to determine when to enter diapause to prepare for winter. Urbanization, however, can alter the relationship between photoperiod and the seasons both because cities tend to be warmer than their surroundings (the urban heat island) and light pollution in cities can lengthen photoperiods. Both can disrupt the use of photoperiod as an adaptive cue for plasticity, unless evolution can alter the response to photoperiod.

This project will build on previous research that demonstrated evolution of urban *P. napi* populations consistent with adaptation to the urban heat island (<https://doi.org/10.1073/pnas.2106006118>). This original study focused specifically on Nordic cities, but light pollution may cause greater problems at low latitudes (<https://doi.org/10.1111/geb.13037>). One of the main goals of the current project is to compare the adaptation of *P. napi* to cities across Europe and test whether urban evolution varies with latitude. The student's project will combine field sampling and lab experiments to test for urban evolution in seasonal plasticity and understand how it varies among cities. Thus, the student will get to participate in field work in cities across Europe with an international network of collaborators. Field and lab work with live insects is often time sensitive, and therefore, the student will sometimes need to work irregular hours on weekends or public holidays, particularly during the summer. As a new project in a new lab, there will be many opportunities for the student to influence the direction of the project and incorporate their own research interests.

Application

Applicants must have a Master's degree in ecology, evolution, or a related topic before starting the position. They should have a strong interest in phenotypic plasticity, global change and/or insects. Statistical and analytical skills will be required for the project (including work with R or another programming language), so applicants should either have prior experience with them or be willing to learn. Previous experience working with insects in the field or lab is a strong plus. A valid driver's

license will facilitate field work. The working language of the group is English (I don't yet speak German), and familiarity with the German language is not required.

As part of the position, the student will help teach during the semesters (roughly equivalent to 2 hours classroom time per week, teaching will be in English). Thus, the student must be willing to teach and prior teaching experience is a benefit, although not required.

I encourage applicants of all personal backgrounds, and I am happy to support international students. I am queer and intend to build a lab that welcomes and supports people of all genders, races/ethnicities, sexual orientations, and abilities/disabilities. As a mentor, I will seek to support your personal and career development and goals.

To apply, please send the following to nielsen.matthew@gmail.com: 1) Cover letter (at most 2 pages) describing your interest in the position and relevant experience and qualifications, 2) CV, 3) unofficial transcripts (or other listing of courses taken), 4) a sample of your scientific writing, and 5) contact information for two references (who may be contacted during the review of applications). All materials should be in English. The scientific writing sample could be your Master's thesis or something else you have already written. It does not need to be the length of a full thesis, and if your thesis is not written in English, it could be a short (~1 page) English-language summary of your thesis work or something else that demonstrates your writing.

Materials should be submitted by Friday, 9 June 2023 for full consideration. The position is available immediately (in practice, as soon as paperwork can be completed), but the starting date is flexible (ideally by September 2023).

If you have any questions about the position, the application, or anything else, please contact me at the above email address.