



University of  
Zurich<sup>UZH</sup>



European Research Council  
Established by the European Commission

Department of Systematic and  
Evolutionary Botany

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## PhD Position in Insect Chemical Ecology and Evolutionary Biology (4-year appointment)

I am seeking a highly motivated PhD student to join my ERC-funded research project CARDEVOL to work on the physiological, ecological, and evolutionary adaptations of herbivores to novel plant defences. The student will join my research group at the Department of Systematic and Evolutionary Botany, University of Zürich, Switzerland. For more information on my research, visit [www.plant-insect.org](http://www.plant-insect.org)

### Project

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Plants produce a tremendous diversity of secondary metabolites as chemical defences against attack by diverse communities of herbivores. In turn, herbivores may evolve resistance mechanisms to cope with these chemicals, allowing them to specialize on defended plants and escape competition from more generalist herbivores. In evolutionary recent times, plants in the Brassicaceae genus *Erysimum* have gained the ability to produce novel toxic cardenolides, in addition to the ancestral glucosinolate defences of all Brassicaceae plants. While several Brassicaceae-specialized herbivores can tolerate glucosinolate defences, there has been no confirmed case of specialized cardenolide resistance evolving in the *Erysimum* system to date.

The CARDEVOL project aims to make use of this evolutionary gain of a novel plant trait to elucidate the consequences of phytochemical diversification for plant-herbivore interactions. As part of this PhD project, we will identify resistance mechanisms in insect herbivores towards novel chemical plant defences. The successful candidate will work with a diverse set of insect herbivores from different feeding guilds and with varying degrees of host plant specialization. The student will quantify current levels of tolerance to chemical defences in these herbivores, as generalized tolerance may serve as evolutionary stepping stones towards specialized resistance. The student will also be involved in an experiment of natural selection that will attempt to evolve specialized herbivore resistance in real time. Potential mechanisms of resistance will be identified through physiological experimentation, analysis of transcriptomic responses towards exposure to the novel defence, and transcriptomic and genomic analyses of evolving herbivore populations.

### Applicant

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The ideal candidate will have completed an MSc degree in Ecology, Entomology, or Molecular Biology, and has a **strong track record of using molecular tools and methods** to address **fundamental questions in ecology and evolutionary biology**. Strong preference will be given to candidates with prior knowledge of transcriptomic and/or genomic methods and differential gene expression analysis. Experience in working with insects and insect rearing is advantageous. Good knowledge of English in speaking and writing and familiarity with R (or another programming language) are expected.

### How to apply

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The intended start date for this position is **October 1st 2021**, although the start date can be negotiated. **For full consideration, apply before June 4th**. To apply, submit a **SINGLE PDF** consisting of a 1-page **letter of motivation** detailing previous research experience and relevant skills in field- and lab work, a **CV** including potential publications, and the names and contact information of **two academic references** to [tobias.zuest@uzh.ch](mailto:tobias.zuest@uzh.ch). Please reference PHD2\_CARDEVOL in the subject line.