

## PhD position (ETH ZURICH)

Bewerbungsfrist: k.A.

### PhD Project: Influence of spatial and temporal separation on population structure of the European cockchafer and its main fungal pathogen

#### Introduction

The European cockchafer *Melolontha melolontha* is an important pest in orchards, grasslands, and forests throughout central and eastern Europe. Areas of *M. melolontha* infestation have been well documented since more than 100 years and detailed maps of the temporally shifted populations with 3 or 4 year life cycles are available. *Beauveria brongniartii* (Ascomycota: Hypocreales) is the most important antagonist of this insect. A biological control agent (BCA) based on this fungus has been developed and is applied in Europe since 1990.

Despite the wealth of information and the economic interest, effects of the geographic separation and temporal isolation due to annually distinct swarming flights on population structures of the insect and the pathogen are unknown. The aim of the project will be to investigate how spatial (location) and/or temporal (different flight years) separation affects the genetic population structure of *M. melolontha* and to study the genetic structure of *B. brongniartii* and the interaction with co-occurring *M. melolontha* populations.

#### Tasks

- Complement existing collections of *M. melolontha* and *B. brongniartii* by sampling infested sites in Switzerland, Austria and other European countries.
- Investigate genetic diversity of *M. melolontha* and *B. brongniartii* samples collected from different sites from 2016 to 2018 using ddRADseq and SSR methodologies.
- Perform in depth population genetic analyses of *M. melolontha* and *B. brongniartii* and apply detailed co-occurrence network analyses to determine spatial and temporal correspondence patterns between *M. melolontha* and *B. brongniartii* populations.

#### Requirements

- MSc in entomology, mycology, ecology, and/or agronomy
- Expertise in molecular genetics and insect-fungus interactions
- Experience with statistics (R) in ecology and/or bioinformatics is advantageous
- Achievement-oriented, open-minded personality with good capacity for teamwork
- Good communications skills and good knowledge in German and English are a prerequisite

#### Organisation

Agroscope is an innovative research institute for agriculture and nutrition, run according to the principles of New Public Management. Agroscope is part of the federal administration and is attached to the Federal Department of Economic Affairs, Education and Research EAER. It has research stations at a number of sites around Switzerland but its head office is in Bern (Liebefeld). The research group Molecular Ecology is focused on genetic analyses of microorganism, insects and plants in agricultural contexts. Main interests are the development and application of genetic markers to study genetic diversity, biological pest control, the investigation of biological soil quality as well as plant breeding. We offer an attractive project and work environment in a young and multidisciplinary research team as well as thorough initial training. Agroscope has excellent research facilities with well-equipped laboratories, greenhouses, climate chambers and agricultural fields. You will enjoy flexible working hours and good employee benefits. You will be enrolled as a PhD student at ETH Zürich

Place of Work: Agroscope, Zurich-Affoltern

Salary Category: According to the guidelines of the Swiss National Science Foundation

Employment Level: 100%

#### Application

If this challenge appeals to you and you meet our requirements profile, we look forward to receiving your online application to [human.resources@agroscope.admin.ch](mailto:human.resources@agroscope.admin.ch) (REF. 34900). Online applications consist of a single PDF containing an application letter, CV, copy of certificates/Diplomas (MSc & BSc) and Email addresses of 2 referees. The position is open until filled. For further information: Dr. Jürg Enkerli senior scientist Molecular Ecology, phone +41 58 468 72 06, [juerg.enkerli@agroscope.admin.ch](mailto:juerg.enkerli@agroscope.admin.ch) (Do not send applications to this e-mail). Starting date: September 1st 2018 or upon agreement - Duration: 4 years.