Understanding the changes in genetic diversity in time and space

A PhD position in population genomics is available in the Plant Ecological Genetics group at ETH Zurich. The aim of the project is to understand how anthropogenic impacts (e.g. habitat fragmentation, disturbance or pollution) shape genome-wide patterns of genetic diversity and the genetic structure of populations in time and space. It is well established that rapid environmental changes pose a threat to biodiversity. In recent years, much emphasis has been put on monitoring changes in species and habitat diversity. At the same time, we know much less about extant genetic diversity in natural populations and how it has been affected both in time and space by rapid environmental changes mediated by human impact. However, genetic diversity is considered a prerequisite for adaptation, and hence essential for the long-term persistence of populations and species under continuing environmental change. This PhD project aims to identify drivers of changes in genome-wide diversity and population genetic structure over time and space in multiple plant (and potentially animal) species using an individual whole-genome re-sequencing approach. The sampling and analysis of extant populations will be complemented by a retrospective approach in which the genetic diversity in historic herbarium or museum specimens is analysed. This allows reconstructing changes in genetic diversity over at least one century and may help identifying underlying factors driving changes in genetic diversity over time and space. Based on this knowledge, an applied goal is to develop conservation management strategies that prevent further erosion of genetic diversity and maintain the adaptive potential of populations and species.

For this project we seek highly motivated applicants with a solid background in population and conservation genomics, evolutionary biology and bioinformatics. Applicants are expected to work independently, to communicate and collaborate with a wide diversity of stakeholders and have strong analytical and writing skills.

The PhD candidate is supervised by Dr. Martin C. Fischer and Prof. Alex Widmer of the Plant Ecological Genetics group at the Institute of Integrative Biology at ETH Zurich, Switzerland (https://peg.ethz.ch). The project is facilitated by access to state of the art infrastructure, including the Genetic Diversity Centre (http://www.gdc.ethz.ch/) and the Functional Genomics Center Zurich (http://www.fgcz.ethz.ch/). The working language is English, but advanced knowledge of German and French is important for interactions with Swiss stakeholders.

Applications consisting of a CV with names and contact information for two references, publication list and a motivation letter with a statement of research interests (not longer than 2 pages) should be prepared as a single pdf file and sent by e-mail before 10 May 2020 to Dr. Martin C. Fischer (martin.fischer@env.ethz.ch). The position can start from June 2020.

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