MSc IN EVOLUTIONARY ECOLOGY AND GENETICS OF ICELANDIC ARCTIC CHARR

Location: University of Guelph and Hólar University College, Iceland. Field work occurs in the lava caves around Lake Myvatn northern Iceland.

Advisors: Dr. Moira Ferguson, University of Guelph, Guelph, ON Canada and Dr. Camille Leblanc, Hólar University College, Iceland.

Numerous ecological and evolutionary processes contribute to the generation of biodiversity, and the complexity of their interactions has presented a challenge to our understanding of nature. Our knowledge of the roles of development, natural selection, genetic drift, and gene flow in shaping biodiversity is complicated by the spatial and temporal variability inherent in natural systems. A powerful approach to better understand such processes involves monitoring wild populations over generations and obtaining data including pedigrees, phenotype, and fitness, so that we can directly infer evolutionary parameters, particularly those describing selection and genetic variation. We are seeking a talented MSc student to apply such an approach to wild populations of Icelandic Arctic charr, in order to further our understanding of the complex interplay among genes, phenotypes, and ecology, in natural environments.

The successful MSc student will test important microevolutionary theories with individual-based phenotypic records, molecular genetic (SNP) data, and ecological data from 19 populations of Arctic charr residing in a spatially replicated system of lava caves in the Myvatn area of northern Iceland. The monitoring of these populations began in 2012 and provides an impressive long-term dataset for novel insights. Advanced analytical techniques will be used to understand spatial and temporal patterns of genetic variation, natural selection, and ecological covariates. The student will be based at the University of Guelph with Prof. Moira Ferguson but will spend time at Hólar University College with Dr. Camille Leblanc (including annual fieldwork). Our ideal candidate will have interests in evolution, ecology, and genetics, and will have strong quantitative skills - necessary for the advanced analytical techniques used in this field. The student will be able to work independently and as part of a larger team, both in the laboratory and in the field.

The project is part of a long term collaboration between the University of Guelph, Canada (Prof. Moira Ferguson), Hólar University College (Prof. Bjarni K. Kristjánsson, Prof. Skúli Skúlason and Dr. Camille Leblanc), the University of Iceland (Prof. Sigurður S. Snorrason, and Prof. Arni Einarsson), EAWAG, Switzerland (Dr. Katja Räsänen), and the University of St Andrews (Dr. Michael Morrissey). The project is funded by The Icelandic Science Foundation – Rannís and NSERC (Canada). The position will be filled as soon as a good candidate is found (target date 1. May 2018). The funding for the graduate student positions is sufficient to cover living costs and University of Guelph tuition fees for Canadian citizens or permanent residents.

Applicants should send an application letter with a max. 1 page statement of research interests and relevant experience, curriculum vitae, copies of academic qualifications including copies of unofficial transcripts and the names and e-mail addresses of three referees, as a single pdf file to Dr. Moira Ferguson (mmfergus@uoguelph.ca).

For further information contact Dr. Moira Ferguson, Professor at the University of Guelph.