Institut des Sciences de l'Evolution de Montpellier

PhD fellowship in Evolutionary Ecology within the GAIA Doctoral School

What governs the dynamics of a species' range?

The diversity of species on earth is influenced by four processes: diversity increases through immigration and speciation, it decreases due to emigration and extinctions. Thus, dispersal is a central driver of diversity and is particularly relevant for explaining its spatial dynamics. Therefore, studying the causes and consequences of dispersal is a logic starting point to build a sound understanding of the spatial dynamics of diverse ecological systems.

In this context, we propose a PhD project which combines theoretical modelling and experimental evolution to elucidate a long-standing question in biogeography: Do abiotic or biotic forces govern the dynamics of a species' range? Currently, one believes that the stronger an abiotic stress the less species interactions matter for defining range dynamics ("Species Interactions-Abiotic Stress Hypothesis", SIASH, Louthan et al., 2015, Trends Ecol. Evol.). In order to elucidate this question and explore it from an evolutionary perspective the doctoral researcher will combine knowledge gained in eco-evolutionary simulations (e.g., Kubisch et al. 2016, Ecography) and through experimental evolution (using the model organism *Tetrahymena thermophila*; e.g. Fronhofer et al. 2015, Nature Commun.). Research will include (1) the study of life-history evolution and its consequences during single species range expansions into abiotic gradients as well as (2) the study of the eco-evolutionary dynamics of range expansions of communities. Ultimately, the candidate will combine this knowledge and elucidate (3) what the relative impact of abiotic gradients and species interactions is on the ecological and evolutionary dynamics of species expanding their range.

The project will be co-supervised by Prof. Dr. Michael Hochberg (DRCE CNRS, External Professor Santa Fe Institute) and Dr. Emanuel A. Fronhofer (CR CNRS) and based at the Institut des Sciences de l'Evolution (ISEM; http://www.isem.univ-montp2.fr/) and the University of Montpellier (UM; http://www.umontpellier.fr/), France.

Competitive applicants will have a solid background in evolutionary biology or evolutionary ecology. They will have programming experience (including e.g. R, C++), experimental skills (experimental evolution, microbial ecology) or the motivation to acquire these skills in a short amount of time. Candidates will be highly motivated, enthusiastic and independent persons with a passion for science. Excellent communication and writing skills in English, good work ethics, and creative thinking are desired.

Montpellier offers a highly stimulating and international research environment (UM has been ranked second world-wide in ecology; Shanghai Ranking 2017), excellent research facilities and a lively and social working place.

For more information see http://www.eec.univ-montp2.fr/ and https://www.emanuelfronhofer.net/ or contact Emanuel Fronhofer (emanue.fronhofer@umontpellier.fr).

Applications must be submitted via the GAIA doctoral school (https://gaia.umontpellier.fr/**) before May 16 2018.** Applicants will be subject to a competitive entrance exam by the GAIA admission commission.