

## **Ecology and evolution of social impact and responsiveness in a wild sparrow population**

Two PhD-positions in Behavioral Ecology at LMU Munich

Application deadline: 28.02.2021

### **Project description**

Social interactions characterize all wild populations and affect evolution whenever heritable traits are plastic in response to heritable traits of conspecifics. The evolution of “social responsiveness” to and “social impact” on other’s phenotypes has attracted theoretical attention, but progress requires addressing key outstanding questions: Do wild populations contain individual variation in degrees of social impact and responsiveness? Does selection act on this variation, and which processes maintain it? These key challenges will be addressed in a research programme to understand social evolution. The overarching aim is to combine the strengths of cutting-edge behavioural ecology and quantitative genetics theory to uniquely study the interplay between social interactions and social selection in the wild. We will focus on social foraging strategies in house sparrows on Norwegian islands that use either private information and actively find food (“producers”) or social information to exploit food patches found by others (“scroungers”). Game theory predicts socially responsive shifts towards scrounging when others produce, and vice versa. Using innovative high-throughput behavioural screening of entire populations, we aim to assay >600 birds for their producer-scrounger social impact and responsiveness in >4,000 assays and determine genomic relatedness, survival, and reproductive fitness for all individuals. We will address the following key objectives:

**PhD-project 1** will establish whether individuals are repeatable in (i) average level of producing-scrounging (“personality”), (ii) level of adjustment in producing-scrounging to phenotypes expressed by partners (“social responsiveness”) and (iii) producing-scrounging elicited in partners (“social impact”). We will quantify covariances between these ‘traits’, describe (social) environmental sources of variation within and among individuals, and test for covariances with various key behavioural (aggression, exploratory tendency) and morphology traits (body size and shape) predicted by adaptive theory.

**PhD-project 2** will quantify how natural selection acts on producing-scrounging reaction norms and study whether selection pressures covary with key socioecological conditions; and thus determine the pathways (components of fitness) by which selection acts on this variation in the social phenotype in this well-studied system. This will make it possible to start exploring the potential evolutionary consequences of selection on social impact and responsiveness in the wild, thereby providing crucial new insights into the evolution of social behaviour and the role of social interactions in ecological and evolutionary processes.

## **Research and Project group**

The PhD-students will be embedded in the Behavioural Ecology Group of the Ludwig Maximilian's University of Munich, located in Martinsried. The group works broadly on two topics: individual behaviour and life-history (Prof. NJ Dingemane) and pre- and post-copulatory sexual selection (Dr. C Tuni). Our group consists of five PhD-students and two postdocs, offering a dynamic social environment. The PhD-projects are part of a collaboration with the Centre for Biodiversity Dynamics at NTNU (Trondheim). International collaborators: Profs. B-E Saether, H Jensen, T-H Ringsby, J Wright (NTNU), Prof. A. Wilson (Exeter) and Prof. J. Morrand-Ferron (Ottawa). PhD-students have the opportunity to apply for admission to the International Research School for Organismal Biology of the Max Planck Institute for Ornithology, which offers high-quality teaching programs for PhD-students and ample opportunity for networking and collaboration.

## **Requirements**

The two successful candidates should have background training in evolutionary biology and behavioural ecology. We are looking for candidates that have experience with fieldwork, bird handling, and are able to work independently. Coding skills are required for programming electronics equipment (sophisticated PIT-tag readers) and performing complex statistical analyses (e.g. multivariate animal models to estimate IGEs). Social skills and ability to flourish in a team are important for winter fieldwork in Norway and various collaborative aspects. Successful candidates speak fluent English. Command of Norwegian is a pro.

## **Project duration and starting date**

Successful candidates will be offered a three-year PhD-position funded by a grant of the German Science Foundation to Prof. NJ Dingemane. Starting date is 01.09.2021.

## **Application package**

Candidates should send a motivation letter and CV to Prof. N. Dingemane over email ([n.dingemane@lmu.de](mailto:n.dingemane@lmu.de)). Candidates should indicate which project they would prefer and why. Submission deadline is 28.02.2021.