Master thesis opportunity at the Max Planck Institute for Biological Intelligence

Understanding male reproductive cooperation between different alternative reproductive male morphs in the Ruff *Calidris pugnax*


Photo: Simon Vandepitte

The Ruff *Calidris pugnax* is an Old-World wader with three **genetically fixed male mating morphs**. Males of the ancient morph, so called Independents are highly aggressive and territorial and have a clear dominance hierarchy. They gather on leks in the breeding season and perform courting display to attract females. In contrast, Satellites are non-territorial and non-aggressive males that join territorial Independents on their courts to **cooperatively display** for copulations. The co-display in this species is finely regulated; the two males cooperate to attract females to their court but as soon as a female arrives their alliance suddenly turns into competition since both are aiming to copulate with the female.

We employ two approaches to investigate the **function and mechanism of co-display** in Ruffs, specifically the motives and benefits of cooperation for the Independent males and optimal partner choice strategies of the Satellites. We run **mate choice experiments** in our aviary population of Ruffs at the **Max Planck Institute for Biological Intelligence** in Seewiesen (see pre-registration with the detailed experimental protocol: Belojevic at al. 2021 - https://osf.io/b6f7e). Furthermore, we carry out lek observations and collect male and female mating behaviour data in a **wild breeding population in Finland**. In Finland we additionally monitor nesting activity of females and chick survival, and develop better management practices for conservation. We code and analyse videos and pictures taken in the aviary and in the field with the help of **behaviour coding software** such as BORIS , furthermore, we are also working on **self-developed AI-based detection and tracking software** to prepare the data for publications.

We are seeking enthusiastic and highly motivated students who are interested in doing a Master's Project with us and contribute to this work in Seewiesen, Germany. The projects offer a unique opportunity to gain hands-on **experience in both behavioural research and avian breeding programs**. The project involves data processing and analysis, with a primary focus on behavioural coding using pre-recorded videos and photographs. The candidate will learn to carry out behaviour coding and will gain practical experience in data preparation and statistical analysis for manuscripts. In addition to data-related tasks, the student will have the opportunity to gain insight into the breeding program of our aviary population from April onwards.

The student will have the opportunity to explore how individual and morph-specific behaviours and decisions influence population structures, as well as the ecological and evolutionary processes that shape and maintain intraspecific diversity.

We provide detailed training and supervision and the student will attend our lab meetings and journal clubs, where they can discuss latest scientific research, learn about state-of-the-art methods and scientific project management.

Project leaders:

Dr. Krisztina Kupán and Dr. Clemens Küpper

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