

2 PHD positions on the behaviour ecology of shorebirds in Madagascar

1) Behavioural ecology meets disease biology and immuno-ecology

2) The scent of Madagascar plovers: communication or concealment?

2 PhD positions (3 years), Bielefeld University (Germany), Universities of Bath and Bristol (UK)

Supervisors: 1) Oliver Krüger, Tamás Székely and 2) Barbara Caspers, Innes Cuthill

Mating systems and parental behaviour are among the most diverse social behaviours, and recent research suggests that the social environment influences these behaviours. Small plovers (*Charadrius* spp.) exhibit highly variable breeding systems, between and within species, making them an ideal model system for studying the causes and consequences of sex ratio variation. The objective of these studentships is to investigate these fundamental issues by means of fieldwork in three plover populations in Madagascar. The research builds on the results from previous successful studentships working with these birds.

We seek two bright and highly motivated students with strong interests in evolutionary ecology and behavioural ecology. Willingness to carry out fieldwork in a harsh tropical environment is essential for this position. The students will search for nests, trap birds and take blood and preen gland samples and record their behaviour. In addition, they will use molecular methods and chemical analysis in the laboratory. Previous experience with avian field biology or any other field experience in the tropics is very important.

Fieldwork will be in a remote and pristine location in SW Madagascar. Facilities are extremely basic, the weather can be very harsh, and a great deal of walking and cycling are required. Opportunities for outside communication are very limited. You must be physically fit, hard-working and meticulous, and have a proven ability to work independently. You must have a positive attitude and an ability to look after yourself (i.e. cook your own meals, deal with logistics and organise your own work over extended periods). Speaking French is advantageous, but not a requirement.

Project 1 Behavioural ecology meets disease biology and immuno-ecology

(Supervisors: Oliver Krüger, Joe Hoffman, Nayden Chakarov, Tamás Székely)

The aim of this project is to study the immune-ecological causes of sex ratio bias in three sympatric species of plovers with varying mating systems at one site in Madagascar. At which stage of the life cycle do mortality differences between the sexes emerge and what are the demographic consequences of these differences? We aim to experimentally manipulate parasite infection and load in plovers but also monitor the populations closely to find the proximate causes of the adult sex ratio biases previously described. In addition, the student will test hypotheses of mating system evolution, and develop demographic models to estimate key demographic properties of natural populations., statistical modelling and/or immunological techniques is advantageous. Strong quantitative skills are essential, and willingness to programme is a must.

Project 2 The scent of Madagascar plovers: communication or concealment?

(Supervisors: Barbara Caspers, Innes Cuthill, Tamás Székely)

The aim of this project is to investigate the function of preen gland secretion variation in three sympatric species of plovers with varying mating systems at one site in Madagascar. Within the last decades various hypothesis have emerged, which will be tested using this unique study system. Using state of the art chemical analysis techniques together with behavioural experiments and molecular techniques we will

investigate whether plovers change their preen gland composition to protect themselves, their chicks or eggs against microbes, or olfactory hunting predators, or in order to communicate with conspecifics.

These projects will provide cutting edge training in evolutionary biology, behavioural ecology and disease biology. In addition, the student will be involved in biodiversity conservation impact of the projects by working with local conservationists and training Malagasy students in field biology and conservation.

Key references

- Eberhart-Phillips, L. J., Küpper, C., Carmona-Isunza, M. C., Vincze, O., Zefania, S., Cruz-Lopez, M., Kosztolanyi, A., Miller, T. E. X., Barta, Z., Cuthill, I. C., Burke, T., Szekely, T., Hoffman, J. I. & Krüger, O. (2018) Demographic causes of adult sex ratio variation and their consequences for parental cooperation. *Nature Comm.* **9**: 1651.
- Ancona, S., Denes, F. V., Krüger, O., Szekely, T. & Beissinger, S. R. (2017) Estimating adult sex ratios in nature. *Phil. Trans. R. Soc. Lond. B* **372**: 20160313.
- Eberhart-Phillips, L. J., Küpper, C., Miller, T. E. X., Cruz-Lopez, M., Maher, K., dos Remedios, N., Stoffel, M. A., Hoffman, J. I., Krüger, O. & Szekely, T. (2017) Sex-specific early survival drives adult sex ratio bias in snowy plovers and impacts mating system and population growth. *Proc. Natl. Acad. Sci. USA* **114**: E5474-E5481.

The students will be based at the Department of Animal Behaviour at Bielefeld University (www.uni-bielefeld.de/biologie/animalbehaviour.html). The Department is the oldest of its kind in Germany and currently hosts 6 Principal Investigators, 7 Postdocs and 20 PhD students. It offers a stimulating international environment and an excellent research infrastructure with access to state-of-the-art techniques. The working language of the Department is English. The students will also spend some of their time at the Universities of Bath (www.bath.ac.uk/bio-sci/biodiversity-lab/index.htm) and Bristol (www.bristol.ac.uk/), United Kingdom.

These two studentships (E13/65%) are funded by the German Science Foundation (DFG) and are available for 3 years. Full funding is available for fieldwork and for attending conferences. Please send your CV, the name of 2 referees, and a concise statement of your research interests as a single PDF file to: oliver.krueger@uni-bielefeld.de (project 1) or Barbara.caspers@uni-bielefeld.de (project 2). For further information concerning these positions, please contact Oliver Krüger (oliver.krueger@uni-bielefeld.de), Barbara Caspers (barbara.caspers@uni-bielefeld.de) or Tamás Székely (bssts@bath.ac.uk).

Bielefeld University is an equal opportunity employer. We welcome applications from severely handicapped people. We particularly welcome applications from women. Given equal suitability, qualifications and professional achievement, women will be given preference, unless particular circumstances pertaining to a male applicant predominate.

The deadline for applications is 31.5. 2019.

Interviews will be held soon thereafter and the positions are available as soon as possible.