



**[M.Sc. thesis] Mechanical advantage of earwig pincers in an evolutionary framework**

Earwigs (Dermaptera) are well-known for their specialized appendages of the last abdominal segment (cerci). These pincer-like tools show a great variety of shapes and are used for defence, prey-capturing, mating and/or wing folding. While the shape of these multi-purpose tools is commonly used as a taxonomic character, it is unknown which ecological factors shape the diversity of these appendages and their lever mechanics.

An der Immenburg 1  
53121 Bonn  
Tel. 0228/73-5xxx  
Fax 0228/73-5129  
[blanke@uni-bonn.de](mailto:blanke@uni-bonn.de)  
[www.evolution.uni-bonn.de](http://www.evolution.uni-bonn.de)

Bonn, 10.08.2020

The aim of this study is to identify the main factors influencing cerci evolution focussing on the interplay of shape and lever mechanics. The applicant will develop a semi-automatic workflow to analyse previously published 2D-images of earwig cerci. In order to understand the influence of different ecological factors such as food preference or microhabitat, our database on ecological niche occupation of the studied species will be expanded, and location data from public electronic databases will be used to study cerci evolution in relation to geographical range.

Prospective candidates should have acquired skills/knowledge in two or more following topics during their studies:

- basic knowledge about insect morphology, systematics and evolution
- basic knowledge of statistics
- basic knowledge in a programming language

The project will involve mainly computational approaches to capture and analyse the morphology of earwig cercis using already published 2D-images. Additionally, the applicant is expected to expand a literature database on the ecology of the studied species.

Of course candidates can expect to receive in-depth training regarding the above methodological topics. Candidates can expect to gain skills in programming, statistics, working with large datasets of different types and image analysis all of which will be beneficial for a career in science or the industry.

Applications should contain your CV, your transcript of records and a short statement about your motivation to work on the depicted topic in **one** PDF file.

The successful candidate will be supported financially with a student assistant (SHK) contract.

Contact can be made in English or German with Dr. Alexander Blanke (E-mail: [blanke@uni-bonn.de](mailto:blanke@uni-bonn.de)). Information about the workgroup can be found online <https://zoologie.uni-koeln.de/arbeitsgruppen/ag-blanke>

Universitätskasse Bonn:

Sparkasse KölnBonn  
BIC: COLSDE 33  
IBAN: DE08370501980000057695

The workgroup will move to the Institute of Evolutionary Biology and Animal Ecology, University of Bonn, An der Immenburg 1, 53121 Bonn in September 2020. Work on the thesis can start in October or later.

USt.-Id-Nr.:  
DE 122 119 125