Rheinische
Friedrich-Wilhelms-
Universität Bonn

Institut für
Evolutionsbiologie und
Ökologie

Universität Bonn · Evolutionsbiologie & Ökologie · D-53121 Bonn

Dr. Alexander Blanke
Arbeitsgruppe Morphological Dynamics

An der Immenburg 1
53121 Bonn
Tel.: +49 228 73 5xxx
Fax: +49 228 73 5129
blanke@uni-bonn.de
www.evolution.uni-bonn.de

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[M.Sc. thesis] Influence of diet on head shape variation in two species of grasshoppers

Orthoptera (grasshoppers, gryllids, etc.) are among the most destructive feeders worldwide. When swarming, they can devastate whole landscapes with large swarms eating as much plants as the whole human population of France within one day. A grasshopper can eat the equivalent of its body mass per day. Compare this to a blue whale which eats just 1.5% of its body mass per day. The underlying basis for this extreme food intake capability are the head capsule and mandibles. It was advocated that head and mandible shape vary according to food source on a macroevolutionary level. However, the dynamics of head and mandible shape in relation to the use of different food sources on a population level remained unclear so far. This project is designed to investigate how head and mandible shape change in relation to different dietary preferences in two closely related taxa of orthopterans. Micro Computed Tomography (µCT) will be used to obtain detailed 3D information about the shape of specimens which have been collected previously in the field or reared under laboratory conditions. Statistical methods will be used to quantify head and mandible shape change. Ecological traits such as food preference will be recorded in the field or in the lab and these data will be analysed together with the shape data.

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

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). Information about the workgroup can be found online https://zoologie.uni-koeln.de/arbeitsgruppen/ag-blanke

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.